Service Manual

Nakamichi

Cassette Deck

CONTENTS

1. GENERAL

1.1. Production No.

Production No.: A327

1.2. Destinations

USA, CAN, EP, UK, AUS, SAU, OTR, JPN

Abbreviation

USA — U.S.A.	AUS — Australia
CAN — Canada	SAU — Saudi Arabia
EP — Europe	OTR — Other
UK — United Kingdom	JPN — Japan

1.3. Parts Supply

(1) Unstocked Parts

Parts marked with "★" at the head of part No. are not stocked. So, it takes time to supply the parts after we receive your order.

(2) Unsupplied Parts

Parts without part Nos. (indicated as "—" in the parts list) are not supplied.

1.4. CAUTIONS/WARNINGS

(1) Product Safety Notice

Parts marked with the symbol ⚠ in the schematic diagram have critical characteristics.

Use ONLY replacement parts recommended by the manufacturer.

It is recommended that the unit be operated from a suitable DC supply or batteries during initial check-out procedures.

(2) Leakage Current Check/Resistance Check

Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamp, or if the resistance from chassis to either side of the power cord is less than 240 k ohms, the unit is defective.

WARNING — DO NOT return the unit to the customer until the problem is located and corrected.

1.5. Voltage Selector

Voltage selector is installed on the Rear Panel of the Nakamichi Cassette Deck 2 (Other & Saudi Arabia). The voltage selector can select either 110 V/127 V or 220 V/240 V at customer's disposal.

1.6. Package Ass'y and Accessory Ass'y

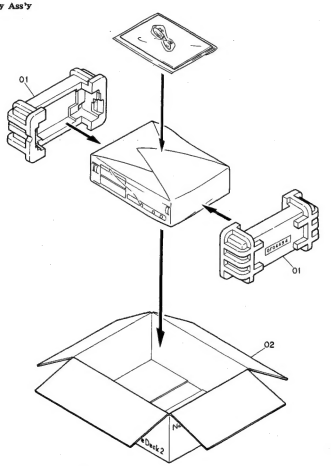


Fig. 1

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
		Package Ass'y			DA04397A	Accessory Ass'y (USA, CAN)	1
					DA04399A	Accessory Ass'y (EP)	1
01	0F04434A	Packing	2		DA04406A	Accessory Ass'y (UK)	1
02	0F04456A	Carton Box	1		DA04398A	Accessory Ass'y (AUS, SAU, OTR)	1
					DA04396A	Accessory Ass'y (JPN)	1
					0D06116A	Owner's Manual (English/French/ Germany)	1
					0D06115A	Owner's Manual (Japanese)	1
					DA04388A	Pin-Pin Cord Ass'y	2

2. REMOVAL PROCEDURES

2.1. Top Cover Ass'y
Refer to Fig. 2.1.
(1) Loosen screws F01 (2 pcs.) and F02 (4 pcs.), and remove F03 (Top Cover Ass'y).

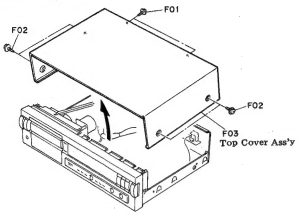


Fig. 2.1

2.2. Cassette Case Cover Ass'y
Refer to Fig. 2.2.
(1) Press the Eject Knob Ass'y to open F01 (Cassette Case Cover Ass'y).
(2) Pull F01 (Cassette Case Cover Ass'y) upward.

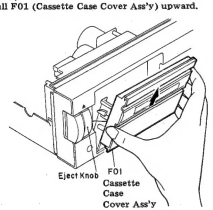


Fig. 2.2

2.3. Mechanism Ass'y
Refer to Fig. 2.3.
(1) Remove the Top Cover Ass'y referring to item 2.1.
(2) Remove the Cassette Case Cover Ass'y referring to item 2.2.
(3) Loosen screws F01 (3 pcs.) and F02 (1 pce.).
(4) Disconnect connectors (CN-4, CN-5, CN-6, CN-14 and CN-15).
(5) Remove F03 (Mechanism Ass'y) in the direction of the arrow.

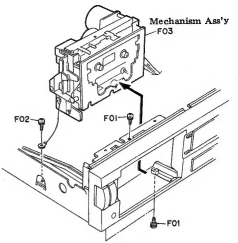


Fig. 2.3

2.4. Front Panel Ass'y
Refer to Figs. 2.4.1 and 2.4.2.
(1) Remove the Top Cover Ass'y referring to item 2.1.
(2) Loosen screws F03 (2 pcs.), F02 (1 pce.) and F03 (2 pcs.). See Fig. 2.4.1.
(3) Press claws A (3 pcs.) downward to unhook them.
(4) Disconnect a connector (CN-9) and remove F04 (Front Panel Ass'y). See Fig. 2.4.2.

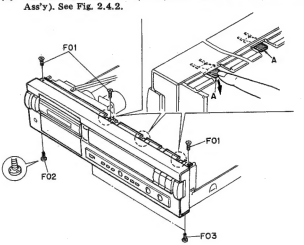


Fig. 2.4.1

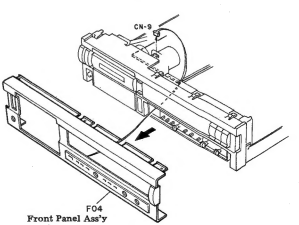


Fig. 2.4.2

2.5. Main P.C.B. Ass'y
Refer to Figs. 2.5.1 and 2.5.2.
(1) Remove the Front Panel Ass'y referring to item 2.4.
(2) Loosen screws F01 (4 pcs.), F02 (1 pce.) and F03 (2 pcs.). See Fig. 2.5.1.
(3) Slide out F04 (Front Chassis Ass'y & Main P.C.B. Ass'y) forward.
(4) Loosen screws F05 (2 pcs.) and F06 (2 pcs.), and remove F07 (Shield Plate). See Fig. 2.5.2.
(5) Loosen screws F08 (2 pcs.) and remove F09 (Main P.C.B. Ass'y).

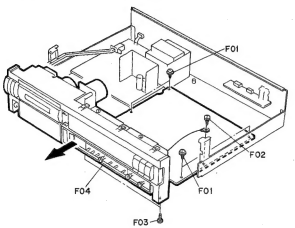


Fig. 2.5.1

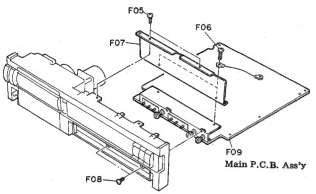


Fig. 2.5.2

2.6. Power Supply & Logic P.C.B. Ass'y
Refer to Fig. 2.6.
Caution: Unplug the power cord from the AC outlet.
(1) Remove the Top Cover Ass'y referring to item 2.1.
(2) Push F01 (Power Switch Joint) rearward (in the direction Ⓐ).
(3) Pull F01 (Power Switch Joint) frontward (in the direction Ⓑ) and lift it in the direction Ⓒ to disengage F01 (Power Switch Joint) from the Power Switch.
(4) Remove F01 (Power Switch Joint).
(5) Loosen screws F02 (1 pce.), F03 (3 pcs.) and F04 (1 pce.), and remove F05 (Power Supply & Logic P.C.B. Ass'y).

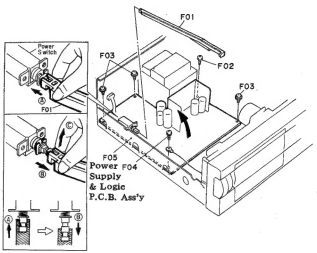


Fig. 2.6

2.7. Control Switch & Display P.C.B. Ass'y
Refer to Fig. 2.7.
(1) Remove the Front Panel Ass'y referring to item 2.4.
(2) Loosen screws F01 (2 pcs.) and F02 (2 pcs.), and remove F03 (Shield Plate).
(3) Loosen screws F04 (2 pcs.), unhook claws (5 pcs.), and remove F05 (Control Switch & Display P.C.B. Ass'y).

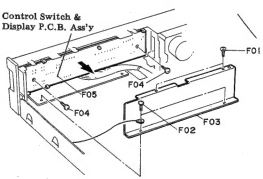


Fig. 2.7

3. TEST TAPES AND GAUGES

(1) 400 Hz Level Tape (DA09005B)
(2) 1 kHz Track Alignment Tape (DA09007B)
(3) 10 kHz PB Frequency Response Tape (DA09003B)
(4) 15 kHz PB Frequency Response Tape (DA09002B)
(5) 20 kHz PB Frequency Response Tape (DA09001B)
(6) 15 kHz Azimuth Tape (DA09004B)
(7) 3 kHz Speed and Wow/Flutter Tape (DA09006C)
(8) Tape Travelling Cassette (DA09071A)
(9) Reference EXII Tape (DA09111A)
(10) Reference SX Tape (DA09110A)
(11) Reference ZX Tape (DA09109A)
(12) Head Alignment Gauge (DA09092B)
(13) Torque Gauge FWD (DA09082A)

4. MECHANICAL ADJUSTMENTS

4.1. Tape Guide Height Check for Record/Playback Head and Erase Head

With use of a Head Alignment Gauge (DA09092B), tape guide height check for the Record/Playback and Erase Heads shall be made, wherein a small block shall be pushed straight down to the base while in use of the Head Alignmeht Gauge (DA09092B).
Refer to Fig. 4.1.

(1) Record/Playback Head Tape Guide Height

(a) Load the base of the Head Alignmeht Gauge (DA09092B) carefully and set the cassette deck in Play mode.
(b) Place the small block of the Head Alignment Gauge (DA09092B) on the base.
(c) Slide the small block against the tape guide of the Record/Playback Head, and check to insure that the block is accepted by the tape guide.
(d) If not, loosen the screw and insert a shim (either 30 μm (0C80048A), 60 μm (0C80038A), or 100 μm (0C80039A)) to raise the Record/Playback Head, then tighten and apply a quantity of lock tight paint to the screw.

(2) Erase Head Tape Guide Height

(a) Load the base of the Head Alignment Gauge (DA09092B) carefully and set the cassette deck in Play mode.
(b) Place the small block of the Head Alignment Gauge (DA09092B) on the base.
(c) Slide the small block against the tape guide of the Erase Head, and check whether the block is accepted by the tape guide.

4.2. Head Base Stroke Check

Refer to Fig. 4.2.
(1) Load the base of the Head Alignment Gauge (DA09092B) carefully, then push the base toward the Record/Playback Head to eliminate the clearance between the reference pin and the base.
(2) Set the cassette deck in Play mode.
(3) Place the small block of the Head Alignment Gauge (DA09092B) on the base.
(4) Contact the small block with the Record/Playback Head surface and the Erase Head surface, and check whether the end of the small block is located within the specified tolerance as shown in Fig. 4.2.

4.3. Record/Playback Head Azimuth Alignment and Height Check

Refer to Fig. 4.1.
(1) Contact an AC voltmeter to the Output Jacks.
(2) Load a 15 kHz Azimuth Tape (DA09004B) and set the cassette deck in Play mode.
(3) Turn the Azimuth Alignment Screw until the outputs of both channels become maximum.
(4) Load a 1 kHz Track Alignment Tape (DA09007B) and set the cassette deck in Play mode.
(5) Check to insure that the readings of both channels on the AC voltmeter are below −25 dB.
If not, replacement of the Record/Playback Head will be required.
(6) Apply a quantity of lock tight paint to the Azimuth Alignment Screw.

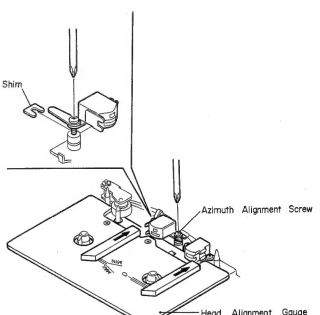


Fig. 4.1

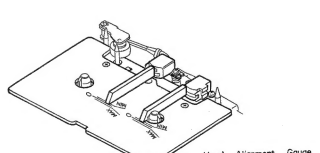


Fig. 4.2

4.4. Pressure Adjustment of Pressure Roller

Refer to Fig. 4.3.

(1) In Play mode, measure the Pressure of the Pressure Roller against the capstan and check whether the pressure is in a range of 360 ±40 g.

(2) If pressure is out of the range, correct it by changing the installation point of the Pressure Roller Spring.

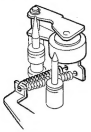


Fig. 4.3

4.5. Tape Travelling Check

Load a Tape Travelling Cassette (DA09071A) and set the cassette deck in Play mode to check the followings:

(1) After more than 2 seconds, the fluctuation of the tape travelling on the Record/Playback Head is small.

(2) Tape is in contact with the head sufficiently.

(3) Tape waving is small on the heads and pressure roller.

Fig. 4.4

4.6. Eject Damper Adjustment

Refer to Fig. 4.5. Load a cassette tape, and with opening the Cassette Case by pressing the Eject button and closing it by hand, adjust the speed of damper action by the Damper Adjustment Screw.

CCW: Damper moves fast.
CW: Damper moves slowly.

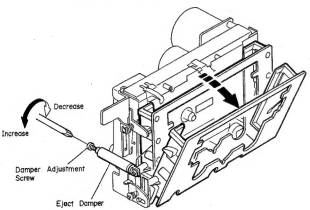


Fig. 4.5

4.7. Reel Motor Speed Adjustment in Play Mode

(1) Load a Torque Gauge FWD (DA09082A) and set the cassette deck in Play mode.

(2) After 5 to 10 seconds, adjust VR501 on the Power Supply & Logic P.C.B. Ass'y to obtain exactly 45 g-cm on the torque gauge.

(3) Check that the back tension is in a range of 1.5 to 5 g-cm.

4.8. Tape Speed Adjustment

Refer to Fig. 4.6.

(1) Connect a frequency counter to the Output Jacks.

(2) Load a 3 kHz Speed and Wow/Flutter Tape (DA09006C) and play it back.

(3) Adjust the Tape Speed Adjustment Volume incorporated in the Capstan Motor to obtain 3,000 Hz on the frequency counter.
CCW: Motor drives slowly.
CW: Motor drives fast.

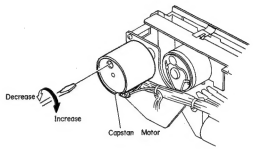


Fig. 4.6

4.9. Lubrication

The tape transport is of a lubrication-free type mechanism. When the following parts are replaced, apply the specified lubricant.

(1) Molykote (R) Grease (X5-6020)
Cam Motor Pulley
Thrust portion on the Capstan Shaft

(2) FLOIL GB-TS-1
Washer between Reel Hub Ass'y and Back Tension Spring

(3) Diamond Oil (EP-56)
Reel Hub Shaft

(4) Anderol 456
Capstan Shaft

Note: We suggest that you use the above specified lubricant or equivalent type.
The company dealing in the above lubricant is as follows:

(a) Molykote (R) Grease (X5-6020)
Dowcorning Co., Ltd., 1-15-1 Nishishinbashi, Minato-ku, Tokyo, Japan

(b) FLOIL GB-TS-1
Kanto Chemicals Co., Ltd., 2-7 Kanda Sakuma-cho, Chiyoda-ku, Tokyo, Japan

(c) Diamond Oil (EP-56)
Mitsubishi Oil Co., Ltd., 1-2-4 Toranomon, Minato-ku, Tokyo, Japan

(d) Anderol 456
Toyo Kokusai Oil Co., Ltd., 3-3-5 Hatchobori, Chuo-ku, Tokyo, Japan

5. PARTS LOCATION FOR ELECTRICAL ADJUSTMENTS

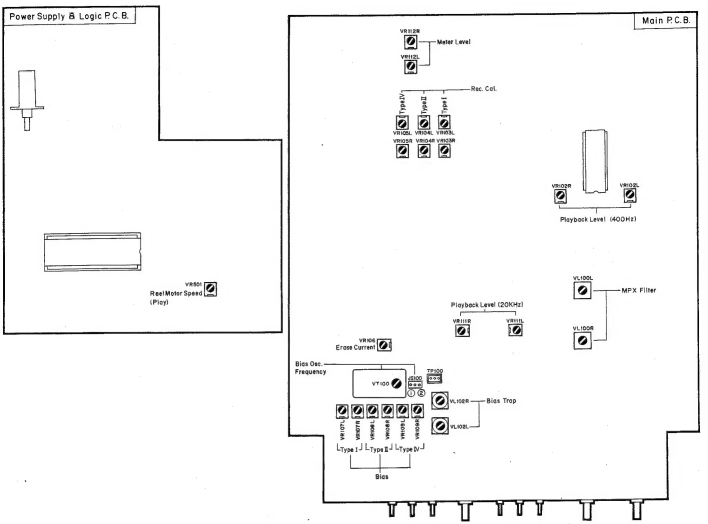
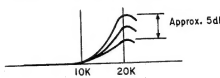


Fig. 5

6. ELECTRICAL ADJUSTMENTS

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST-MENT	REMARKS
1	Preliminary Step			Balance - Center **Bias Tune - Center** Tape - Type IV MPX Filter - OFF Dolby NR - OFF		Set the Cassette Deck 2 as shown in MODE.
2	Reel Motor Speed Adjustment (Play)	Torque Gauge FWD (DA09082A)		Playback	Power Supply & Logic P.C.B. VR501	1. Play back a Torque Gauge FWD and adjust VR501 to obtain 45 g-cm on the torque gauge. 2. Check that the deviation of the torque value is within ±5 g-cm of the center value.
3	Tape Speed Adjustment	3 kHz Speed and Wow/ Flutter Tape (DA09006C)	Frequency Counter to Output Jacks	Playback Tape - Type IV	Tape Speed Adj. Volume (Capstan Motor)	Adjust the volume incorporated in the capstan motor to obtain 3 kHz ±15 Hz on the frequency counter.
4	Meter Level Calibration	400 Hz to Input Jacks	AC Volt-meter to Output Jacks	Record,Pause	Main P.C.B. VR112L VR112R	1. Feed in 400 Hz and adjust the Rec Level control to obtain 500 mV -0.5 dB on the AC voltmeter. 2. Adjust VR112L (VR112R) so that the 0 dB segment of the level meter starts illuminating.
5	MPX Filter Adjustment	19 kHz ±100 Hz to Input Jacks	AC Volt-meter to Output Jacks	Record,Pause MPX - OFF/ON	Main P.C.B. VL100L VL100R	1. Adjust the Rec Level control to obtain 500 mV (0 dB) on the AC voltmeter. 2. Set the MPX Filter switch to ON and adjust VL100L (VL100R) to obtain minimum reading on the AC voltmeter (minimum reading will be less than -30 dB).
6	Record/ Playback Head Azimuth Alignment	15 kHz Azimuth Tape (DA09004B)	AC Volt-meter to Output Jacks	Playback Dolby NR - OFF MPX - OFF Tape - Type IV	Record/ Playback Head Azimuth Align-ment Screw	Adjust the Record/Playback Head Azimuth Alignment Screw to obtain maximum readings for both channels on the AC voltmeter.
7	Playback Level Calibration	400 Hz Level Tape (DA09005B)	AC Volt-meter to Output Jacks	Same as above	Main P.C.B. VR102L VR102R	Adjust VR102L (VR102R) to obtain 500 mV on the AC voltmeter.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST-MENT	REMARKS
8	Playback Frequency Response Adjustment	400 Hz Level Tape (DA09005B) 10 kHz PB Frequency Response Tape (DA09003B) 15 kHz PB Frequency Response Tape (DA09002B) 20 kHz PB Frequency Response Tape (DA09001B)	AC Volt-meter to Output Jacks	Playback Dolby NR - OFF MPX - OFF Tape - Type IV	Main P.C.B. VR111L VR111R	1. Load a 400 Hz level tape, play it back, and read the playback level. 2. Load 10 kHz, 15 kHz and 20 kHz PB frequency response tapes and play them back. Adjust the record/play-back head azimuth to obtain maximum readings for both channels on the AC voltmeter with each tape. Check that the playback levels are as follows with respect to the level for 400 Hz level tape. 10 kHz: -20 dB -2 to +2 dB 15 kHz: -20 dB -2 to +3 dB 20 kHz: -20 dB -2 to +4 dB If the level at 20 kHz is out of the range, adjust VR111L (VR111R) to obtain satisfactory results. VR111L (VR111R) compensates the playback frequency response at 20 kHz as shown below:  3. Conduct step 6 "Record/Playback Head Azimuth Alignment".
9	Bias Oscillation Frequency and Erase Current Adjustment	None	Frequency Counter between terminals 1 and 2 of CN15 on Main P.C.B. and AC Volt-meter across the additional 0.1 ohm resistor	Record,Pause Tape - Type I Dolby NR - OFF MPX - OFF	Main P.C.B. VT100 JS100 VR106	1. Connect an additional 0.1 ohm resistor in series to the Erase Head and connect the AC voltmeter across it. 2. Adjust VT100 to obtain 105 kHz ±1 kHz on the frequency counter. If bias oscillation frequency is above 106 kHz, short-circuit JS100 with a jumper wire as shown left and re-adjust VT100 again. 3. Adjust VR106 to obtain 20 mV (200 mA) on the AC voltmeter. 4. After completion of the erase current adjustment, re-check the bias oscillation frequency. 5. Remove the additional 0.1 ohm resistor.
		[Serial No.:A32705801] JS100 ① ② or ① ② f1 > f2		[Serial Nos.: A32701001-05800] JS100		
10	Bias Trap Adjustment (Record Amp.)	None (remove input signals)	AC Volt-meter between pins 1 (Lch) and 2 (GND) or 3 (Rch) and 2 (GND) of TP100 on Main P.C.B.	Same as above	Main P.C.B. VL102L VL102R	Adjust VL102L (VL102R) to obtain minimum reading on the AC voltmeter.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST-MENT	REMARKS
11	Record Level Calibration and Recording Bias Current Adjustment	400 Hz (0 dB) and 18 kHz (-20 dB) to Input Jacks	AC Volt-meter and Distortion Meter to Output Jacks	Record and Playback Tape - Type IV/II/I Dolby NR - OFF/C MPX - OFF	Main P.C.B. (Level) Type IV VR105L VR105R Type II VR104L VR104R Type I VR103L VR103R (Bias) Type IV VR109L VR109R Type II VR108L VR108R Type I VR107L VR107R	Adjustment should be made in the order of ZX, SX and EX tapes. 1. Set the cassette deck in Record/Pause mode. 2. Feed in 400 Hz and adjust the Rec Level control to obtain 500 mV (0 dB) on the AC voltmeter. 3. Load a reference ZX tape, reference SX tape and reference EXII tape. 4. Set the Dolby NR switch to OFF. 5. Feed in 400 Hz (0 dB) and record, rewind, and play it back. Adjust VR105L (VR105R) for ZX tape, VR104L (VR104R) for SX tape and VR103L (VR103R) for EXII tape so that the played back output levels are 500 mV (0 dB) on the AC voltmeter. 6. Set the Dolby NR switch to C. 7. Feed in 18 kHz (-20 dB) and record, rewind, and play it back. Adjust VR109L (VR109R) for ZX tape, VR108L (VR108R) for SX tape and VR107L (VR107R) for EXII tape so that the played back output levels are 50 mV (-20 dB) on the AC voltmeter. 8. Repeat above 4 to 8 two or three times. 9. Set the Dolby NR switch to OFF. 10. Feed in 400 Hz (0 dB) and record, rewind, and play it back. Check to insure that the total harmonic distortion is less than 1.2% for ZX and EXII tapes and 1.6% for SX tape. If the total harmonic distortion exceeds the specified value, re-adjust VR111L (VR111R) in Step 8 "Playback Frequency Response Adjustment", and repeat above steps till satisfactory results are obtained.

7. MECHANISM ASS'Y AND PARTS LIST

7.1. Synthesis

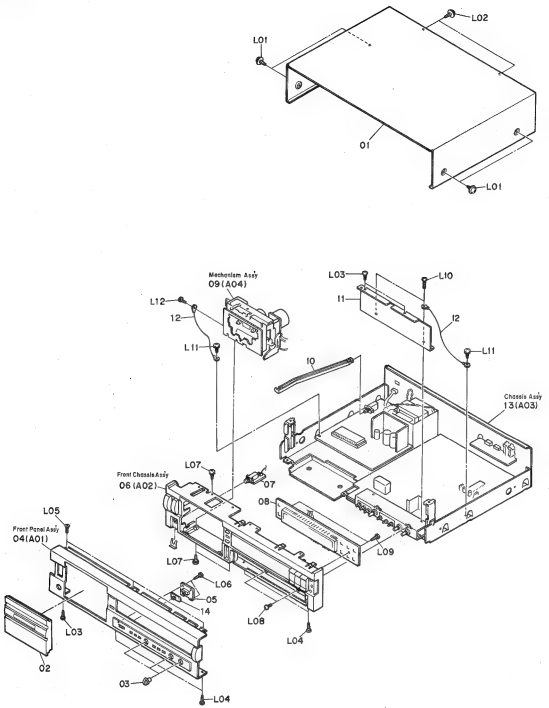


Fig. 7.1

★: Unstocked parts.

Schematic Ref. No.		Part No.	Description	Q'ty
7.1. Synthesis				
			Synthesis	
01		0H05710A	Top Cover	1
02	★	HA05935A	Cassette Case Cover Ass'y	1
03		0H05711A	Volume Knob	3
04	★	HA05930A	Front Panel Ass'y	1
05	★	BA07947A	Timer Switch P.C.B. Ass'y	1
06		—	Front Chassis Ass'y	1
07	★	BA07960A	Headphone P.C.B. Ass'y	1
08	★	BA07945A	Control Switch & Display P.C.B. Ass'y	1
09	★	CA09049A	Mechanism Ass'y	1
10		0J06258A	Power Switch Joint	1
11		0J06259A	Shield Plate	1
12		0B83916A	Mechanism GND Wire Ass'y	2
13		—	Chassis Ass'y	1
14		0H05824A	Slide Knob	1
L01		0E03032A	BT4x8 ⊕ Binding Washer Faced (Black Chromate)	
L02		0E03632A	BT3x8 ⊕ Binding Washer Faced (Black Chromate)	
L03		0E03366A	BT3x8 ⊕ Binding (Black Chromate)	
L04		0E00921A	BT3x8 ⊕ Binding (Black Chromate)	
L05		0E03054A	BT3x8 ⊕ Countersunk	
L06		0E00860A	BT2.6x6 ⊕ Binding	
L07		0E03212A	BT2.6x6 ⊕ Binding with Toothed Lock Washer	
L08		0E00896A	M3x6 ⊕ Binding	
L09		0E00868A	BT3x8 ⊕ Binding (Black Chromate)	
L10		0E03551A	M3x8 ⊕ Binding Projected	
L11		0E03157A	BT3x6 ⊕ Binding with Washer	
L12		0E00859A	BT2.6x6 ⊕ Binding	
7.2. Front Panel Ass'y				
A01		HA05930A	Front Panel Ass'y	1
01		0H05714A	Dummy Cap	1
02		0J06253A	Push Knob Spring	6
03		0H05818A	Push Knob	6
L01		0E00855A	BT2x6 ⊕ Binding	
7.3. Front Chassis Ass'y				
A02		—	Front Chassis Ass'y	1
01		0H05723A	Power Switch Button	1
02		0C09392A	Power Switch Spring	1
03		HA05929A	Eject Knob Ass'y	1
04		0J06252A	Eject Spring	1
05		0H05716A	Control Knob A	3
06		0H05825A	Tact Knob	2

7.2. Front Panel Ass'y (A01)

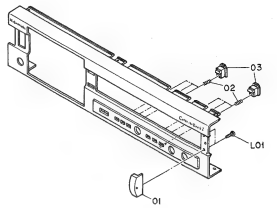


Fig. 7.2

7.3. Front Chassis Ass'y (A02)

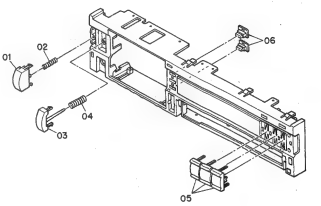


Fig. 7.3

7.4. Chassis Ass'y (A03)

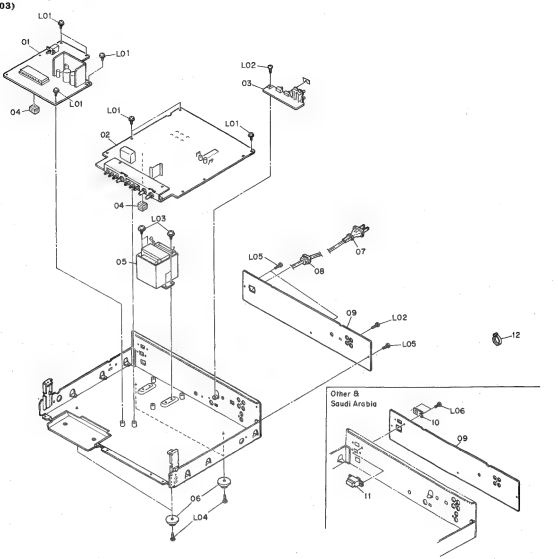


Fig. 7.4

★: Unstocked parts.

Schematic Ref. No.		Part No.	Description	Q'ty
7.4. Chassis Ass'y				
A03		—	**Chassis Ass'y**	**1**
01	★	BA07944A	Power Supply & Logic P.C.B. Ass'y (USA, CAN, EP, UK, AUS, SAU, OTR)	1
01	★	BA07961A	Power Supply & Logic P.C.B. Ass'y (JPN)	1
02	★	BA07959A	Main F.C.B. Ass'y	1
03	★	BA07946A	Pin Jack P.C.B. Ass'y	1
04		0J06267A	F.C.B. Cushion	5
05		0B50176A	Power Transformer 120V (USA, CAN)	1
		0B50178A	Power Transformer 230V (EP, UK, AUS)	1
		0B50177A	Power Transformer (SAU, OTR)	1
		0B50175A	Power Transformer 100V (JPN)	1
06		HA05833A	Leg Ass'y	4
07		0B08504A	Power Cord (USA, CAN)	1
		0B08093U	Power Cord (EP)	1
		0B08348A	Power Cord (UK)	1
		0B05241A	Power Cord (AUS)	1
		0B08219B	Power Cord (JPN)	1
		0B08533A	Power Cord (SAU, OTR)	1
08		0B90280A	Cord Bushing (USA, CAN, EP, AUS)	1
		0B90283A	Cord Bushing (UK, SAU, OTR, JPN)	1
09		0H05830A	Rear Panel (USA, CAN, EP, UK, AUS, JPN)	1
		0H05847A	Rear Panel (SAU, OTR)	1
10		0M05611A	Voltage Lock Plate (OTR, SAU)	1
11		0B07092U	Voltage Selector Switch (SAU, OTR)	1
12		0B90019A	Insu-Lock	2
L01		0E03157A	BT3x8 ⊕ Binding With Washer	
L02		0E03366A	BT3x8 ⊕ Binding Projected (Black Chromate)	
L03		0E03592A	BT4x6 ⊕ Binding Washer Faced (Black Chromate)	
L04		0E03012A	BT3x12 ⊕ Binding (Black Chromate)	
L05		0E00860A	BT3x6 ⊕ Binding (Black Chromate)	
L06		0E00985A	M3x6 ⊕ Binding (Black Chromate) (SAU, OTR)	

★: Unstocked parts.

Schematic Ref. No.		Part No.	Description	Q'ty
7.5. Mechanism Ass'y				
A04	★	CA09049A	Mechanism Ass'y	1
01		0C85310A	Eject Arm Spring	1
02		0C85309A	Eject Arm	1
03		CA80006A	Damper Ass'y	1
04		0C82720A	Eject Lever Spring	1
05		0C85414A	Eject Lever A	1
06		0C85301A	Cassette Case Holder L	1
07		0C80037A	Insu-Lock	4
08		0C80019B	Eject Spring	1
09		0C80013A	Lock Lever Spring	1
10		0C80014A	Lock Lever Collar	1
11		0C82719A	Lock Lever B	1
12		CA80725A	Take-up Reel Hub Ass'y	1
13		0C80612A	Spring Holder	2
14		0C80613A	Reel Hub Spring	2
15		CA80001A	Cassette Case Ass'y	1
16		HA05936A	Cover Plate Ass'y	1
17		0G01365A	Erase Head E2D	1
18		0C85303A	2P Connector Ass'y for Erase Head	1
19		0C80044A	Erase Head Collar	2
20		0C82710A	Head Base Hold Plate	1
21		0C80004A	Steel Ball 3mm	1
22		0C80005A	Reinforce Plate	1
23		0G01371A	Record/Playback Head 2G	1
24		0C85304A	6P Connector Ass'y for R/P Head	1
25		0C80045A	Record/Playback Head Collar	1
26		0C82703A	Azimuth Adjust Spring	1
27		0C82697A	Head Base B	1
28		CA80726A	Supply Reel Hub Ass'y	1
29		CA80005A	Pressure Roller Ass'y	1
30		0C80008A	Pressure Roller Spring	1
31		0C80007A	Steel Ball 2mm	3
32		0C80009A	Cassette Case Spring	1
33		CA81646A	Control Motor Ass'y	1
34		0C80027A	Mode Switch	3
35		0C81415A	Worm Thrust Bush	1
36		0C85302A	Control Motor Holder	1
37		0C85311A	Motor Thrust Stopper	1
38		0C81417A	Cam	1
39		0C80017B	Record Protector Lever	1
40		0C82721A	Mechanism Chassis B	1
41		0C82709A	Cassette Holder Spring	1
42		0C80025A	Record Protector Holder	1
43		0C80024A	Record Protector Switch	1
44	★	CA80011B	Shut-off P.C.B. Ass'y	1
45		CA80304A	Brake Ass'y B	1
46		0C80628A	Brake Spring B	1
47		0C80030A	Reel Motor Holder	1
48		CA81648A	Reel Motor Ass'y	1
49		0C80031A	Capstan Flange	1
50		0C80428A	Hold Spring	1
51		0C80032A	Flywheel	1
52		0C80034A	Capstan Belt	1
53		0C80035A	Sleeve	3
54		0C80036A	Floating Rubber	3
55		CA80009A	Flywheel Holder Ass'y	1
56		CA81647A	Capstan Motor Ass'y	1
57		0C80010D	Cassette Case Holder R	1
58		0C80012A	Eject Sensor Switch	1
59		0C85305A	8P Connector Ass'y	1
60		0C85306A	6P Connector Ass'y	1
61		0C83380A	Idler Gear	1
L01		0E00698A	E-Ring 2.5mm	
L02		0E03052A	CS Stopper 2.4mm	
L03		0E03235A	Damper Washer	
L04		0E00181A	E-Ring 3mm	
L05		0E03042A	FT2.5x5 ⊕ Pan	
L06		0E03043A	FT2.5x10 ⊕ Pan	
L07		0E03437A	FT2.5x3.5 ⊕ Pan	
L08		0E03049A	Washer 1.8x3.2x0.5	
L09		0E03226A	Washer 2.1x4.5x0.1	
L10		0E03038A	M2x12 ⊕ Binding	
L11		0E03436A	TP2x6	
L12		0E03053A	Wire Holder	
L13		0C80038A	Shim 0.06T	
		0C80039A	Shim 0.1T	
		0C80048A	Shim 0.03T	
L14		0E03046A	M2.6x6 ⊕ Pan (2A)	
L15		0E03040A	FT2.5x3.5 ⊕ Pan	
L16		0E00222A	E-Ring 2mm	
L17		0E03035A	M2x3.2 ⊕ Truss	
L18		0E03036A	M2x4 ⊕ Pan (2A)	
L19		0E03044A	FT2.5x20 ⊕ Pan	
L20		0E00691A	M2x3 ⊕ Pan	
L21		0E03048A	FT2.6x6 ⊕ Pan	
L22		0E03041A	FT2.5x4 ⊕ Pan	

7.5. Mechanism Ass'y (A04)

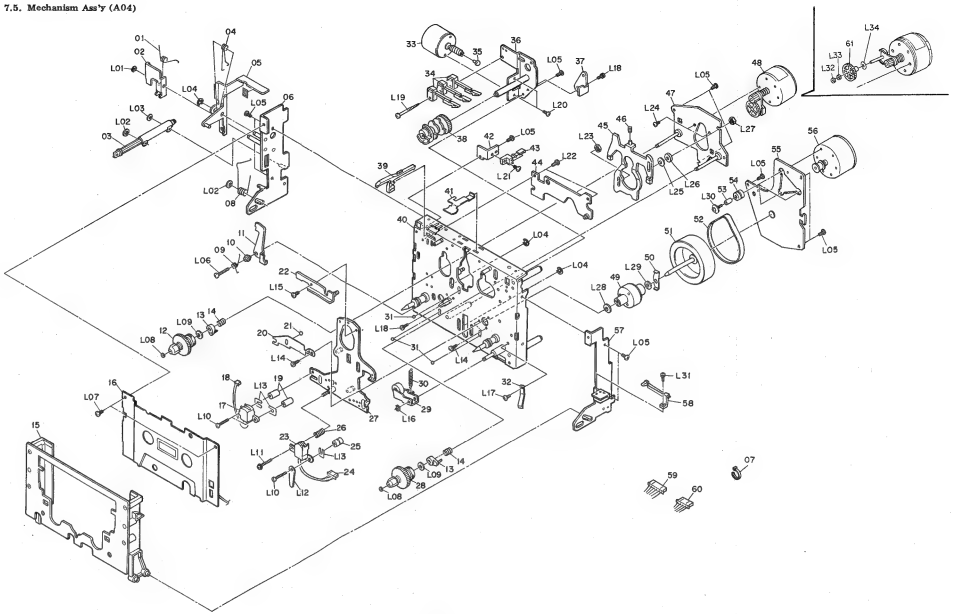


Fig. 7.5

Schematic Ref. No.	Part No.	Description	Q'ty
L23	0E03237A	Nut Hex. M2.6	
L24	0E03045A	M2.6x3 ⊕ Binding	
L25	0C85411A	Brake Washer B	
L26	0C85410A	Brake Washer A	
L27	0E00694A	Nut Hex. M2	
L28	0E03051A	Washer 2.5x7x0.8	
L29	0E03245A	Plastic Washer 1.3x3.3x0.3	
L30	0E03047A	M2.6x9 ⊕ Pan	
L31	0E03037A	M2x5 ⊕ Pan (2A)	
L32	0E03509A	Washer 1.3x3.4x0.5	
L33	0E03653A	Washer 1.6x4x0.25	
L34	0E03508A	Washer 1.7x6x0.25	

8. MOUNTING DIAGRAMS AND PARTS LIST

8.1. Main P.C.B. Ass'y

Notes:
1. Mounting diagram shows a dip side view of the printed circuit board.
2. Diode is 1SS53, 1S1555, or 1SS176 unless otherwise specified.
3. Abbreviation for part name:
   TR — Transistor, SiD — Silicon Diode, ZD — Zener Diode, Varicap — Variable Capacitance Diode
   RK — Carbon Resistor, RM — Metal Film Resistor, RF — Fail Safe Type Resistor, RC — Cement Resistor
   CE — Electrolytic Capacitor, CML — Mylar Capacitor, CC — Ceramic Capacitor, CPP — PP Capacitor, CMM — Metalized Mylar Capacitor, CSP — Polystyrene Capacitor, C — Mica Capacitor, CT — Tantalum Capacitor

- **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
U100	C-5	Q115L	E-4
U101	C-9	Q115R	F-4
U102	F-9	Q116L	E-6
U103	I-9	Q116R	F-6
U104	H-6	Q117	E-2
U105	F-11	Q118L	C-11
U106	H-11	Q118R	C-11
Q100L	D-5	Q120	I-9
Q100R	D-5	Q121L	E-6
Q101L	D-6	Q121R	F-6
Q101R	D-5	ZD100	C-7
Q102L	F-10	ZD101	D-7
Q102R	F-8	ZD102	F-6
Q103	H-8	ZD103L	H-11
Q104	G-7	ZD103R	H-11
Q105L	I-7	ZD104L	I-11
Q105R	G-7	ZD104R	I-11
Q106L	I-6	D100	D-5
Q106R	G-6	D101	H-8
Q107L	E-2	D102	I-7
Q107R	F-3	D103	I-7
Q108L	F-3	D104	G-7
Q108R	F-3	D105	F-2
Q109	E-2	D106	E-7
Q110	I-4	D107	E-6
Q111	I-4	D108	D-11
Q112	H-4	D109L	H-11
Q113L	E-2	D109R	H-11
Q113R	F-3	D110L	I-11
Q114L	E-4	D110R	I-11
Q114R	F-4	D111	F-6

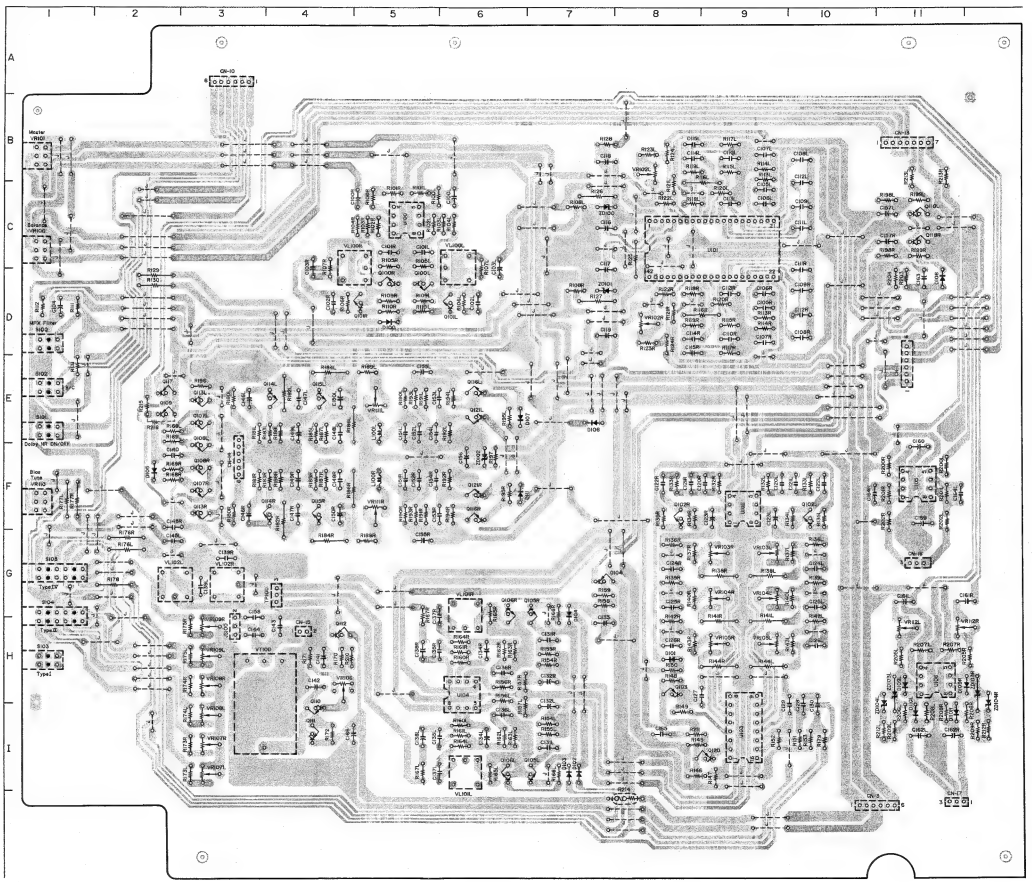


Fig. 8.1

★: Unstocked parts.

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
8.1. Main P.C.B. Ass'y			R124L,R	0B09707A	RK 18K 1/6W J	C102L,R	0B41275A	CML 1200P 50V J
			R125	0B25398A	RM 130K 1/4W F	C103L,R	0B40756A	CE 1µ 50V (LN)
★	BA07959A	Main P.C.B. Ass'y	R126,127	0B24272A	RF 68 1/4W J	C104	0B40115A	CE 4.7µ 50V
			R128	0B09709A	RK 22K 1/6W J	C105L,R	0B41286A	CML 0.01µ 50V J
	0B60831B	Main P.C.B.	R129,130	0B09701A	RK 10K 1/6W J	C106L,R	0B41143A	CPP 5600P 100V G
U100	0B06146A	IC NJM4558DD	R131	0B09689A	RK 3.3K 1/6W J	C107L,R	0B41296A	CML 0.056µ 50V J
U101	0B11363A	IC CX20188	R132L,R	0B09705A	RK 15K 1/6W J	C108L,R	0B41294A	CML 0.068µ 50V J
U102	0B06146A	IC NJM4558DD	R133L,R	0B25277A	RM 7.15K 1/4W F	C109L,R	0B41302A	CML 0.22µ 50V J
U103	0B11027A	IC TC9145P	R134L,R	0B09749A	RK 1M 1/6W J	C110L,R	0B41288A	CML 0.015µ 50V J
U104	0B06387A	IC NJM2043DD	R135L,R	0B09701A	RK 10K 1/6W J	C111L,R	0B41304A	CML 0.15µ 50V J
U105	0B06370A	IC NJM4556D	R136L,R	0B09709A	RK 22K 1/6W J	C112L,R	0B41306A	CML 0.47µ 50V J
U106	0B06124A	IC NJM4558D	R137L,R	0B09693A	RK 4.7K 1/6W J	C113L,R	0B41139A	CPP 3900P 100V G
Q100L,R	0B10033A	TR 2SC1740S	R138L,R	0B09680A	RK 1.8K 1/6W J	C114L,R	0B41138A	CPP 2200P 100V G
Q101L,R	0B10033A	TR 2SC1740S	R139L,R	0B09705A	RK 15K 1/6W J	C115L,R	0B41133A	CPP 2200P 100V G
Q102L,R	0B10033A	TR 2SC1740S	R140L,R	0B09692A	RK 4.3K 1/6W J	C116,117	0B40092A	CE 220µ 25V
Q103	0B10029A	TR 2SA933S	R141L,R	0B09682A	RK 1.6K 1/6W J	C118	0B40115A	CE 4.7µ 50V
Q104	0B10053A	TR DTA144ES	R142L,R	0B09706A	RK 16K 1/6W J	C119	0B40090A	CE 47µ 25V
Q105L,R	0B10067A	TR DTC143TS	R143L,R	0B09701A	RK 10K 1/6W J	C120L,R	0B41277A	CML 1800P 50V J
Q106L,R	0B10033A	TR 2SC1740S	R144L,R	0B09684A	RK 2K 1/6W J	C121L,R	0B41394A	CPP 220P 50V J
Q107L,R	0B06142A	TR 2SC2240 (BL)	R145	0B09717A	RK 47K 1/6W J	C122L,R	0B41282A	CML 4700P 50V J
Q108L,R	0B06142A	TR 2SC2240 (BL)	R146	0B09685A	RK 2.2K 1/6W J	C123L,R	0B40487A	CE 10µ 25V
Q109	0B10102A	TR 2SA1320	R147	0B09695A	RK 5.6K 1/6W J	C124L,R	0B41280A	CML 3300P 50V J
Q110	0B10033A	TR 2SC1740S	R148,149	0B09725A	RK 100K 1/6W J	C125L,R	0B41276A	CML 1500P 50V J
Q111	0B06069A	TR 2SB564	R150	0B09717A	RK 47K 1/6W J	C126L,R	0B41277A	CML 1800P 50V J
Q112	0B10053A	TR DTA144ES	R151,152	0B09733A	RK 220K 1/6W J	C127	0B41298A	CML 0.1µ 50V J
Q113L,R	0B10067A	TR DTC143TS	R153	0B09733A	RK 220K 1/6W J	C128,129	0B41286A	CML 0.01µ 50V J
Q114L,R	0B06142A	TR 2SC2240 (BL)	R154L,R	0B09711A	RK 27K 1/6W J	C130	0B41286A	CML 0.01µ 50V J
Q115L,R	0B06142A	TR 2SC2240 (BL)	R155L,R	0B09719A	RK 56K 1/6W J	C131L,R	0B41281A	CML 3900P 50V J
Q116L,R	0B10033A	TR 2SC1740S	R156L,R	0B09677A	RK 1K 1/6W J	C132L,R	0B40112A	CE 1µ 50V
Q117	0B10053A	TR DTA144ES	R157L,R	0B09741A	RK 470K 1/6W J	C133	0B40112A	CE 1µ 50V
Q118L,R	0B10067A	TR DTC143TS	R158	0B09701A	RK 10K 1/6W J	C134L,R	0B40756A	CE 1µ 50V (LN)
Q120	0B10053A	TR DTA144ES	R159	0B09725A	RK 100K 1/6W J	C135L,R	0B41294A	CML 0.047µ 50V J
Q121L,R	0B10067A	TR DTC143TS	R160L,R	0B09735A	RK 270K 1/6W J	C136L,R	0B41278A	CML 2200P 50V J
ZD100,101	0B12168A	ZD 10V	R161L,R	0B09719A	RK 56K 1/6W J	C137L,R	0B41283A	CML 5600P 50V J
		RD10ZB2	R162L,R	0B09683A	RK 3.3K 1/6W J	C138L,R	0B40487A	CE 10µ 25V
ZD102	0B12168A	ZD 10V	R163L,R	0B09691A	RK 3.9K 1/6W J	C139L,R	0B41709A	CC 47P 50V J
		RD10JSB2	R164L,R	0B09671A	RK 560 1/6W J	C140	0B41974A	CC 100P 50V J
ZD103L,R	0B12273A	ZD 3.3V	R165L,R	0B09647A	RK 47 1/6W J	C141,142	0B41012A	CE 1µ 50V
		RD3.3EB1	R166L,R	0B09705A	RK 15K 1/6W J	C143	0B41432A	CPP 8200P 50V J
ZD104L,R	0B12289A	ZD 5.1V	R167L,R	0B09697A	RK 6.8K 1/6W J	C144	0B41414A	CPP 1500P 50V J
		MTZ5.1C	R168L,R	0B09695A	RK 5.6K 1/6W J	C145L,R	0B41975A	CC 100P 50V J
D100,101	0B06398A	SiD 1SS176	R169L,R	0B09695A	RK 5.6K 1/6W J	C146L,R	0B40732A	CE 22µ 25V (LN)
D102,103	0B06398A	SiD 1SS176	R170	0B09693A	RK 4.7K 1/6W J	C147L,R	0B41394A	CPP 220P 50V J
D104,105	0B06398A	SiD 1SS176	R171	0B09703A	RK 20K 1/6W J	C148L,R	0B41285A	CML 2700P 50V J
D106,107	0B06398A	SiD 1SS176	R172	0B09701A	RK 10K 1/6W J	C149L,R	0B40723A	CE 47µ 16V (LN)
D108	0B06398A	SiD 1SS176	R173L,R	0B09705A	RK 15K 1/6W J	C150L,R	0B40114A	CE 3.3µ 50V
D109L,R	0B06398A	SiD 1SS176	R174L,R	0B09695A	RK 5.6K 1/6W J	C151L,R	0B41274A	CML 1500P 50V J
D110L,R	0B06398A	SiD 1SS176	R175L,R	0B09653A	RK 100 1/6W J	C152L,R	0B41400A	CPP 390P 50V J
D111	0B06398A	SiD 1SS176	R176L,R	0B01683A	RM 100 1/4W F	C153L,R	0B41284A	CML 4800P 50V J
VT100	0B51360B	BIAS OSC BO-1	R177L,R	0B01888A	RK 10K 1/4W J	C154L,R	0B41402A	CPP 470P 50V J
VL100L,R	0B06690A	L-C Block	R178	0B09684A	RK 2K 1/6W J	C155L,R	0B40758A	CE 22µ 50V (LN)
VL101L,R	0B51861A	Receiving Coil	R179	0B09716A	RK 24K 1/6W J	C156	0B40078A	CE 3.3µ 16V
VL102L,R	0B06696A	L-C Block	R180L,R	0B09629A	RK 10 1/6W J	C157L,R	0B40114A	CE 3.3µ 50V
L100L,R	0B03919C	Inductor 36mH	R181L,R	0B09741A	RK 470K 1/6W J	C158	0B41420A	CPP 2700P 50V J
VR100	0B30128A	VR 100KMN	R182L,R	0B09330A	RK 100K 1/4W J			Serial No.:
VR101	0B30126A	VR 100KAx2	R183L,R	0B09651A	RK 82 1/6W J			A32705801 -
VR102L,R	0B32192A	Semi VR 5K	R184L,R	0B09330A	RK 100K 1/4W J	C159,160	0B40078A	CE 100µ 16V
VR103L,R	0B32192A	Semi VR 5K	R185L,R	0B09731A	RK 180K 1/6W J	C161L,R	0B40758A	CE 2.2µ 50V (LN)
VR104L,R	0B32192A	Semi VR 5K	R186L,R	0B25287A	RM 9.09K 1/4W F	C162L,R	0B40758A	CE 2.2µ 50V (LN)
VR105L,R	0B32193A	Semi VR 10K	R187L,R	0B09711A	RK 27K 1/6W J	C163	0B40114A	CE 3.3µ 50V J
VR106	0B32193A	Semi VR 10K	R188L,R	0B09729A	RK 82K 1/6W J	C164L,R	0B41386A	CPP 150P 50V J
VR107L,R	0B32194A	Semi VR 20K	R189L,R	0B09655A	RK 120 1/6W J	C165	0B41298A	CML 0.1µ 50V J
VR108L,R	0B32194A	Semi VR 20K	R190L,R	0B25301A	RM 12.7K 1/4W F	C166	0B40092A	CE 220µ 25V
VR109L,R	0B32194A	Semi VR 20K	R191L,R	0B25293A	RM 10.5K 1/4W F	S100	0B70177A	Push Switch
VR110	0B30127A	VR 100KAx2	R192L,R	0B09749A	RK 1M 1/6W J	S101	0B70177A	Push Switch
VR111L,R	0B32191A	Semi VR 2K	R193L,R	0B09716A	RK 43K 1/6W J	S102	0B70177A	Push Switch
VR112L,R	0B32192A	Semi VR 5K	R194L,R	0B09716A	RK 43K 1/6W J	S103	0B70176A	Push Switch
R100L,R	0B09653A	RK 100 1/6W J	R195L,R	0B09709A	RK 22K 1/6W J	S104	0B70176A	Push Switch
R101L,R	0B09725A	RK 100K 1/6W J	R196	0B09725A	RK 100K 1/6W J	S105	0B70176A	Push Switch
R102L,R	0B25291A	RM 9.31K 1/4W F	R197	0B09677A	RK 1K 1/6W J	JS100	0B84359A	Jack 5P
R103L,R	0B25260A	RM 4.75K 1/4W F	R198L,R	0B09717A	RK 47K 1/6W J			Serial No.:
R104L,R	0B25236A	RM 2.67K 1/4W F	R199L,R	0B09685A	RK 2.2K 1/6W J			A32705801 -
R105L,R	0B09749A	RK 1M 1/6W J	R200L,R	0B09718A	RK 51K 1/6W J		0B84127A	Header 2P
R106L,R	0B09749A	RK 1M 1/6W J	R201L,R	0B09725A	RK 100K 1/6W J			Serial No.:
R107L,R	0B25280A	RM 7.68K 1/4W F	R202L,R	0B09637A	RK 22 1/6W J			A32701001 - 05800
R108L,R	0B09709A	RK 22K 1/6W J	R203	0B09677A	RK 1K 1/6W J	CN3	0B84288A	6P-T Post
R109L,R	0B09689A	RK 3.3K 1/6W J	R204	0B09725A	RK 100K 1/6W J	CN10	0B81463A	6P-T Post
R110L,R	0B09689A	RK 3.3K 1/6W J	R205L,R	0B09677A	RK 1K 1/6W J	CN11	0B84289A	6P-T Post
R111,112	0B09683A	RK 1.8K 1/6W J	R206L,R	0B09749A	RK 1M 1/6W J	CN13	0B81464A	7P-T Post
R113L,R	0B09673A	RK 680 1/6W J	R207L,R	0B09677A	RK 1K 1/6W J	CN14	0B81463A	6P-T Post
R114L,R	0B09700A	RK 9.1K 1/6W J	R208L,R	0B09741A	RK 470K 1/6W J	CN15	0B81459A	2P-T Post
R115L,R	0B09698A	RK 7.5K 1/6W J	R209L,R	0B09696A	RK 6.2K 1/6W J	CN16	0B81460A	3P-T Post
R116L,R	0B25324A	RM 22.1K 1/4W F	R210	0B09701A	RK 10K 1/6W J	CN17	0B84280A	3P-T Post
R117L,R	0B25244A	RM 3.24K 1/4W F	R211	0B09725A	RK 100K 1/6W J	TF100	0B81460A	3P-T Post
R118L,R	0B25251A	RM 3.83K 1/4W F	R212L,R	0B09682A	RK 1.6K 1/6W J		0E00868A	BT3x8 ⊕ Binding (2)
R119L,R	0B25171A	RM 562 1/4W F	R213L,R	0B09653A	RK 100 1/6W J		0J06255A	Volume Holder (1)
R120L,R	0B09749A	RK 1M 1/6W J	R214	0B24023A	Fuse Resistor 1		0J06268A	Main Shield (1)
R121L,R	0B25287A	RM 9.09K 1/4W F	R215,216	0B09717A	RK 47K 1/6W J			
R122L,R	0B25195A	RM 1K 1/4W F	C100L,R	0B40756A	CE 1µ 50V (LN)			
R123L,R	0B09681A	RK 1.5K 1/6W J	C101L,R	0B41279A	CML 2700P 50V J			

8.2. Power Supply & Logic P.C.B. Ass'y

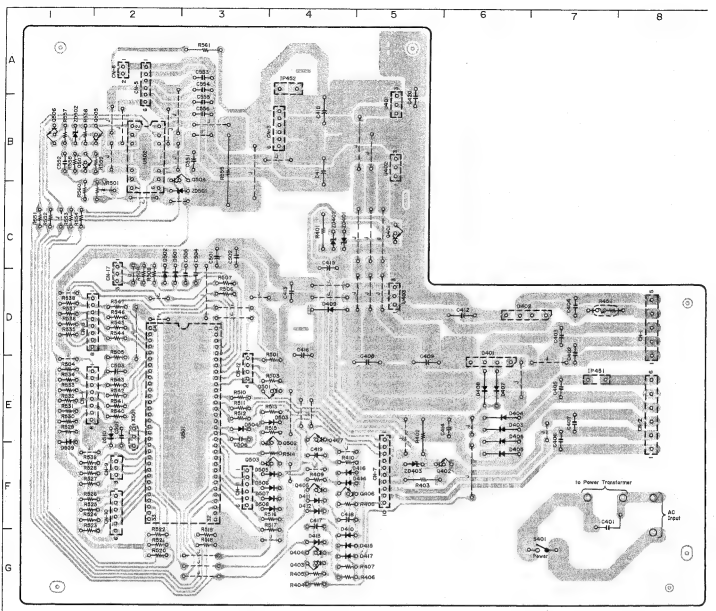


Fig. 8.2

- **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
U401	B-5	Q505	B-2	D411	F-4
U402	B-5	Q506	B-1	D412	F-4
U403	D-5	Q507	B-1	D413	G-4
U501	E-3	ZD401	C-4	D414	F-4
U502	B-2	ZD402	C-4	D415	G-4
IP451	E-7	ZD403	F-5	D416	F-4
IP452	A-4	ZD501	C-3	D417	G-4
Q401	C-5	ZD502	B-1	D501	D-2
Q402	F-6	D401	E-6	D502	D-2
Q403	G-4	D402	D-6	D503	E-4
Q404	G-4	D403	E-6	D504	E-3
Q405	F-4	D404	E-6	D505	F-4
Q406	F-4	D405	F-6	D506	F-4
Q407	E-4	D406	E-6	D507	F-4
Q501	E-4	D407	E-6	D508	F-4
Q502	E-4	D408	E-6	D509	F-1
Q503	F-4	D409	D-4	D510	E-2
Q504	B-3	D410	G-4		

★: Unstocked parts.

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
8.2. Power Supply & Logic P.C.B. Ass'y				— Power Supply —	
	★ BA07944A	Power Supply & Logic P.C.B. Ass'y (USA, CAN, EP, UK, AUS, SAU, OTR)	Q402	0B06303A	TR 2SB772
			Q403,404	0B10030A	TR 2SC1740S
			Q405	0B10062A	TR DTC144ES
			Q406	0B10053A	TR DTA144ES
			Q407	0B10062A	TR DTC144ES
	★ BA07961A	Power Supply & Logic P.C.B. Ass'y (JPN)	IP451	0B11725A	IC ICP-N10-T104RC 0.4A
	— Logic —		IP452	0B11638A	IC ICP-N20-T104RC 0.8A
U501	0B11861A	IC μPD75106CW	ZD401	0B12314A	ZD 12V
U502	0B11368A	IC LB1649			MTZ12B
Q501	0B10068A	TR DTC114ES	ZD402	0B12317A	ZD 13V
Q502	0B10030A	TR 2SC1740S			MTZ13B
Q503	0B10053A	TR DTA144ES	ZD403	0B12285A	ZD 4.7V MTZ4.7A
Q504	0B10062A	TR DTC144ES			
Q505	0B10035A	TR 2SA933S	D401,402	0B06282A	SID DBA10B/DBA10C
Q506	0B10062A	TR DTC144ES			
Q507	0B10030A	TR 2SC1740S	D403,404	0B12365A	SID 1SR35-100A
ZD501	0B12290A	ZD 5.6V	D405,406	0B12365A	SID 1SR35-100A
ZD502	0B12288A	ZD 5.1V	D407,408	0B12365A	SID 1SR35-100A
D501,502	0B06398A	SiD 1SS176	D409	0B12365A	SID 1SR35-100A
D503,504	0B06398A	SiD 1SS176	D410,411	0B06398A	SID 1SS176
D505,506	0B06398A	SiD 1SS176	D412,413	0B06398A	SID 1SS176
D507,508	0B06398A	SiD 1SS176	D414,415	0B06398A	SID 1SS176
D509,510	0B06398A	SiD 1SS176	D416,417	0B06398A	SID 1SS176
X501	0B92038A	Crystal 4.0MHz	R401	0B05629A	RE 2.7K 1/4W J
VR501	0B32192A	Semi VR 5K	R402	0B01681A	RK 3.3K 1/4W J
R501	0B09701A	RK 10K 1/6W J	R403	0B01706A	RK 47 1/4W J
R503	0B09701A	RK 10K 1/6W J	R404	0B09709A	RK 22K 1/6W J
R504	0B09689A	RK 3.3K 1/6W J	R405	0B09703A	RK 12K 1/6W J
R505,506	0B09677A	RK 1K 1/6W J	R406	0B09733A	RK 220K 1/6W J
R507	0B09677A	RK 1K 1/6W J	R407	0B09725A	RK 100K 1/6W J
R508,509	0B09701A	RK 10K 1/6W J	R408	0B09717A	RK 47K 1/6W J
R510	0B09677A	RK 1K 1/6W J	R409	0B09733A	RK 220K 1/6W J
R511,512	0B09677A	RK 1K 1/6W J	R410	0B09701A	RK 10K 1/6W J
R513	0B09693A	RK 4.7K 1/6W J	R451	0B24025A	Fuse Resistor 1
R514,515	0B09701A	RK 10K 1/6W J	C401	0B41825A	CC 4700P 400V (USA, CAN, EP, UK, AUS, SAU, OTR)
R516	0B09693A	RK 4.7K 1/6W J		0B41826A	CC 4700P 250V (JPN)
R517	0B09701A	RK 10K 1/6W J			
R518,519	0B09701A	RK 10K 1/6W J			
R520,521	0B09701A	RK 10K 1/6W J			
R522,523	0B09701A	RK 10K 1/6W J			
R524,525	0B09701A	RK 10K 1/6W J	C402,403	0B47117A	CC 0.1μ 50V Z
R526	0B09701A	RK 10K 1/6W J	C404,405	0B47117A	CC 0.1μ 50V Z
R527,528	0B09701A	RK 10K 1/6W J	C406,407	0B47117A	CC 0.1μ 50V Z
R529	0B09693A	RK 4.7K 1/6W J	C408	0B40097A	CE 3300μ 25V
R530	0B09701A	RK 10K 1/6W J	C409	0B40096A	CE 2200μ 25V
R531,532	0B09701A	RK 10K 1/6W J	C410,411	0B40084A	CE 3300μ 16V
R533,534	0B09701A	RK 10K 1/6W J	C412	0B40085A	CE 4700μ 16V
R535	0B09701A	RK 10K 1/6W J	C413	0B40082A	CE 1000μ 16V
R536,537	0B09701A	RK 10K 1/6W J	C414	0B40121A	CE 220μ 50V
R538	0B09701A	RK 10K 1/6W J	C415	0B40104A	CE 100μ 35V
R539	0B09677A	RK 1K 1/6W J	C416	0B40497A	CE 470μ 25V
R540,541	0B09677A	RK 1K 1/6W J	C417	0B40758A	CE 2.2μ 50V (LN)
R542,543	0B09677A	RK 1K 1/6W J	C418	0B40754A	CE 0.47μ 50V (LN)
R544,545	0B09677A	RK 1K 1/6W J	C419	0B40753A	CE 0.33μ 50V (LN)
R546,547	0B09677A	RK 1K 1/6W J	C420	0B47117A	CC 0.1μ 50V Z
R551,552	0B09677A	RK 1K 1/6W J	S401	0B71012A	Power Switch
R553,554	0B09677A	RK 1K 1/6W J			
R555	0B24273A	RF 27 3W		— Miscellaneous —	
R556	0B09701A	RK 10K 1/6W J			
R557	0B09681A	RK 1.5K 1/6W J		0B60834B	Power Supply & Logic P.C.B.
R558	0B09695A	RK 5.6K 1/6W J			
R559	0B09717A	RK 47K 1/6W J	CN1	0B81323A	5P-T Post VH
R560	0B09677A	RK 1K 1/6W J	CN2	0B81573A	6P-T Post VH
R561	0B05575A	RK 560 1/4W J	CN3	0B83896A	6P Connector Ass'y
C501	0B40078A	CE 100μ 16V	CN4	0B81465A	8P-T Post
C502	0B47117A	CC 0.1μ 50V Z	CN5	0B81463A	6P-T Post
C503	0B40023A	CML 0.22μ 50V	CN6	0B81459A	2P-T Post
C504,505	0B41533A	CC 0.01μ 25V Z	CN7	0B84302A	10P-T Post
C506,507	0B41944A	CC 1000P 50V K	CN8	0B84296A	8P-T Post
C551	0B40078A	CE 100μ 16V	CN9	0B84281A	3P-T Post
C552	0B41286A	CML 0.01μ 50V	CN10	0B83900B	6P Connector Ass'y
C553,554	0B41553A	CC 0.01μ 25V Z	CN11	0B83901B	6P Connector Ass'y
C555,556	0B41553A	CC 0.01μ 25V Z	CN12	0B83902B	4P Connector Ass'y
			CN17	0B83915B	2P Connector Ass'y
	— Heat Sink —			0B84275A	Wrapping Terminal 2P (2)
U401	0B11862A	IC NJM7812FA		0E03355A	Earth Plate (1)
U402	0B11863A	IC NJM7912FA			
U403	0B11753A	IC NJM7805FA			
Q401	0B06451A	TR 2SB1015			
	0E00766A	M3x8 ⊕ Binding (4)			
	0J06256A	Heat Sink (1)			

8.3. Timer Switch P.C.B. Ass'y

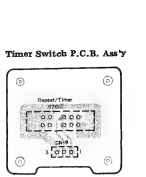


Fig. 8.3

8.4. Headphone P.C.B. Ass'y

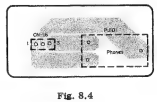


Fig. 8.4

Schematic Ref. No.	Part No.	Description
8.3. Timer Switch P.C.B. Ass'y		
	★ BA07947A	Timer Switch P.C.B. Ass'y
	0B60837B	Timer Switch P.C.B.
S701	0B70175A	Slide Switch 2-4
CN9	0B83899A	3P Connector Ass'y
8.4. Headphone P.C.B. Ass'y		
	★ BA07960A	Headphone P.C.B. Ass'y
	0B60832B	Headphone P.C.B.
PJ101	0B81478A	Headphone Jack
CN16	0B83904A	3P Connector Ass'y

8.5. Pin Jack P.C.B. Ass'y

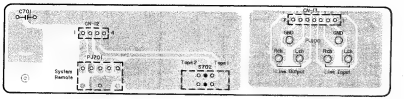


Fig. 8.5

8.6. Shut-off P.C.B. Ass'y

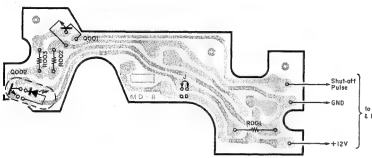
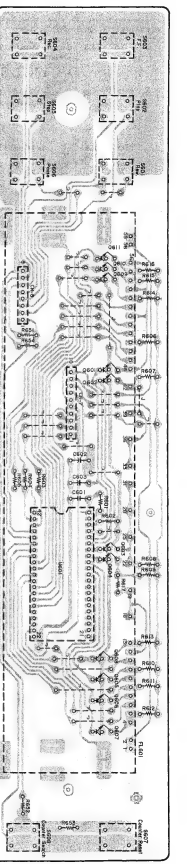


Fig. 8.6

*: Unstocked parts.

Schematic Ref. No.	Part No.	Description
8.5. Pin Jack P.C.B. Ass'y		
*	BA07946A	Pin Jack P.C.B. Ass'y
	0B60836B	Pin Jack P.C.B.
C701	0B41553A	CC 0.01μ
S702	0B70178A	Slide Switch 2-2
PJ100	0B84334A	Pin Jack 4P
PJ701	0B84028A	Stereo Mini
CN12	0B81461A	4P-T Post
CN13	0B83903A	7P Connector Ass'y
	0E03355A	Earth Plate (1)
8.6. Shut-off P.C.B. Ass'y		
*	CA80011B	Shut-off P.C.B. Ass'y
	0C80047A	Shut-off P.C.B.
Q001	0B06388A	TR 2SC2612
Q002	0B06389A	Photo Reflector NJL5141
R001	0C81330A	RM 750
R002	0B09841A	RK 15K
R003	0B09840A	RK 680

8.7. Control Switch & Display P.C.B. Ass'y



Schematic Ref. No.	Part No.	Description
8.7. Control Switch & Display P.C.B. Ass'y		
*	BA07945A	Control Switch & Display P.C.B. Ass'y
	0B60835B	Control Switch & Display P.C.B.
U601	0B11860A	IC MSC7112-01SS
Q601,602	0B10030A	TR 2SC1740S
Q603,604	0B10030A	TR 2SC1740S
Q605,606	0B10030A	TR 2SC1740S
Q607,608	0B10030A	TR 2SC1740S
Q609,610	0B10030A	TR 2SC1740S
Q611	0B10030A	TR 2SC1740S
R601	0B09713A	RK 33K 1/6W J
R602	0B09701A	RK 10K 1/6W J
R603,604	0B09677A	RK 1K 1/6W J
R605	0B09677A	RK 1K 1/6W J
R606,607	0B09717A	RK 47K 1/6W J
R608	0B09717A	RK 47K 1/6W J
R609,610	0B09717A	RK 47K 1/6W J
R611,612	0B09717A	RK 47K 1/6W J
R613,614	0B09717A	RK 47K 1/6W J
R615,616	0B09717A	RK 47K 1/6W J
R617	0B09629A	RK 10 1/6W J
R651	0B09701A	RK 10K 1/6W J
R652	0B09693A	RK 4.7K 1/6W J
R653	0B09709A	RK 15K 1/6W J
R654	0B09701A	RK 10K 1/6W J
C601	0B41974A	CC 100P 50V J
C602	0B40158A	CE 100μ 6.3V
C603	0B40173A	CE 1μ 50V
S601,602	0B70161A	Tact Switch
S603,604	0B70161A	Tact Switch
S605,606	0B70161A	Tact Switch
S607,608	0B70161A	Tact Switch
CN7	0B83897A	10P Connector Ass'y
CN8	0B83898A	8P Connector Ass'y
FL601	0B90461A	FL Display
	0J06258A	FL Cushion (2)
	0J06238A	FL Stopper (2)

Fig. 8.7

9. SCHEMATIC DIAGRAMS

9.1. IC Block Diagrams

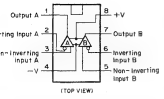
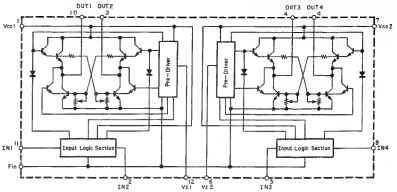


Fig. 9.1.1 Operational Amp. IC 4558D, 4558DD, 4556D, 2043DD



INPUT IN1/3	INPUT IN2/4	OUTPUT OUT1/3	OUTPUT OUT2/4	OPERATION
0	0	O	O	Braking
1	0	1	0	Forward (Reverse)
0	1	0	1	Reverse (Forward)
1	1	0	0	Braking

Fig. 9.1.2 Motor Driver IC LB1649

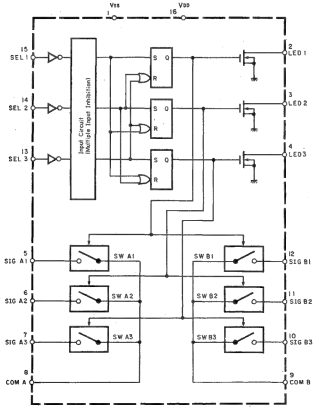
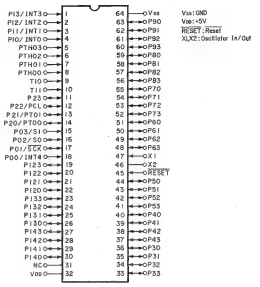


Fig. 9.1.3 Analog Switch Selector TC9145P

U501 μPD75106CW (Microprocessing Unit (MPU))

Pin No.	Signal Name	In/ Out	Function
1 2	—	I	Not used. Connected to GND.
3	$\overline{\text{REM}}$	I	Remote control receiver signal input.
4	RELP	I	Reel motor pulse input. Pulse train is input while take-up reel hub is rotating, i.e., tape is running.
5	LVR	I	Rch input for level meter. Input level is A/D-converted in this IC and the converted result is transferred to the Display Control IC (U601) via pin 13 (DDAT).
6	LVL	I	Lch input for level meter. The function is the same as above LVR (Rch).
7	KS1	I	Record switch input. "L" when pressed.
8	KS0	I	Stop/Counter Search/Counter Reset switch input. Stop switch ON: 0 V Counter Search switch ON: 1.6 V Counter Reset switch ON: 3.3 V
9	MREM	I	System remote mode signal input. "L": "Tape 1" is selected. "H": "Tape 2" is selected.
10	$\overline{\text{HD2/3}}$	I	Connected to GND.
11	—	O	Not used. (Open)
12	$\overline{\text{DCLK}}$	O	Clock for serial data DDAT at pin 13.
13	DDAT	O	Serial data for Display Control IC (U601), which includes display data and control information.
14	DEN	O	Enable signal to Display Control IC (U601). Active "H".
15 16 17	—	I	Not used. Connected to GND.
18	$\overline{\text{POFF}}$	I	Power OFF signal input. Becomes "L" when power is turned OFF. Power OFF H L Approx. 20 msec
19	$\overline{\text{LMUT}}$	O	Line mute signal output. Active "L".
20	$\overline{\text{RMUT}}$	O	Record mute signal output. Active "L". Record mute is released only in Record/Play mode.
21	$\overline{\text{BIAS}}$	O	Bias ON/OFF signal output. "L": Bias ON.
22 23 24	—	O	Not used. (Open)
25	$\overline{\text{HPLY}}$	O	Record/Playback head select signal output. "L": Playback mode. "H": Record mode.
26	$\overline{\text{HREC}}$	O	Record/Playback head select signal output. L: Record mode. "L": Playback mode
27	RMSP	O	Reel motor speed select signal output. Becomes "L" in play mode. H L Reel motor runs slow in Play mode.
28	—	O	Not used. (Open)
29	RMR	O	Reel motor drive control signal output. Becomes "H" in Rewind mode. H L Rewind mode
30	RMF	O	Reel motor drive control signal output. Becomes "H" in Play or Fast Forward mode. H L Play, FF mode
31	NC	—	No connection.
32	VDD	—	Supplied with +5 V.
33 34	—	O	Not used. (Open)
35	ASMR	O	Control motor reverse drive signal output. Becomes "H" when turning the control motor reverse (in the direction of Play-Pause-Stop-FF/REW). Turns control motor reverse. H L
36	ASMF	O	Control motor forward drive signal output. Becomes "H" when turning the control motor forward (in the direction of FF/REW-Stop-Pause-Play). Turns control motor forward. H L
37 38	TAP B TAP A	I	Tape type select signal input. Type: Type I / Type II / Type IV TAP A: H / L / H/L TAP B: H / H / L
39 40	$\overline{\text{B/C}}$ $\overline{\text{DLBY}}$	I	Dolby NR mode select signal input. Mode: Dolby NR OFF / Dolby NR B / Dolby NR C $\overline{\text{DLBY}}$: H / L / L $\overline{\text{B/C}}$: H/L / H / L
41	$\overline{\text{MPX}}$	I	MPX filter switch signal input. "L": MPX Filter ON, "H"=OFF
42 43	TIM B TIM A	I	Repeat/Timer switch signal input. Mode: OFF / Auto Repeat / Timer Play / Timer Record TIM A: H / L / H / L TIM B: H / H / L / L
44	REC PRO	I	Record protect switch signal input. "H": Recording is allowed.
45	$\overline{\text{RESET}}$	I	System reset signal input. Active "L". Power ON H L Approx. 160 msec

Pin No.	Signal Name	In/ Out	Function
46 47	X2 X1	—	4 MHz crystal is connected.
48	—	O	Not used. (Open)
49	$\overline{\text{MREC}}$	O	Record mode signal output. Active "L".
50	$\overline{\text{MPLY}}$	O	Play mode signal output. Active "L".
51	$\overline{\text{MSTP}}$	O	Stop mode signal output. Active "L".
52	RREM	O	System remote return signal output.
53 54 55	—	O	Not used. (Open)
56	$\overline{\text{EJC}}$	I	Cassette In switch signal input. Becomes "L" while the Cassette Cover Ass'y is open.
57 58 59	CAM2 CAM1 CAM0	I	Cam switch signal input. Mode of the mechanism can be sensed according to states of CAM0, CAM1 and CAM2.
60	$\overline{\text{KFF}}$	I	FF switch signal input. "L" when pressed.
61	$\overline{\text{KREW}}$	I	REW switch signal input. "L" when pressed.
62	$\overline{\text{KPUS}}$	I	Pause switch signal input. "L" when pressed.
63	$\overline{\text{KPLY}}$	I	Play switch signal input. "L" when pressed.
64	VSS	—	Grounded.



(TOP VIEW)

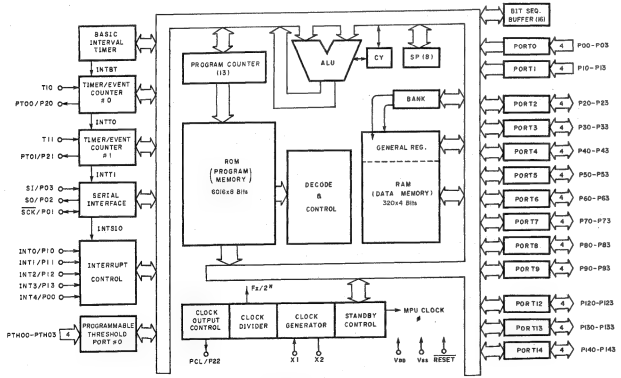


Fig. 9.1.4 Microprocessing Unit (MPU) μPD75106CW

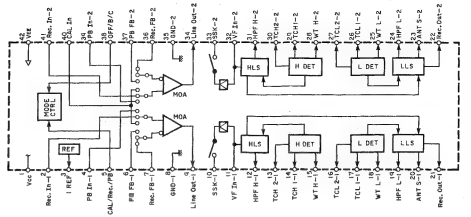


Fig. 9.1.5 Dolby NR IC CX20188

U101 CX20188 (Dolby NR IC)

Pin No.	Signal Name	Function
1	Vcc	Positive power supply input terminal.
2,41	Rec. In	Record signal input terminal.
3	I Ref.	Reference current input terminal.
4,39	PB In	PB signal input terminal.
5	CAL/Rec./ PB	Calibration/Recording/Playback select terminal.
6,37	PB FB	Playback signal feedback terminal.
7,36	Rec. FB	Record signal feedback terminal.
8,35	GND	GND terminal.
9,34	Line Out	Line signal (decoded signal) output terminal.
10,33	SSK	Spectral skewing switch terminal.
11,32	VF In	Encode circuit input terminal.
12,31	HPF H	HLS high-pass filter terminal.
13,30	TCH 2	HLS detector time constant determination terminal 2.

Pin No.	Signal Name	Function
14,29	TCH 1	HLS detector time constant determination terminal 1.
15,28	WT H	HLS weighting terminal.
16,27	TCL 2	LLS detector time constant determination terminal 2.
17,26	TCL 1	LLS detector time constant determination terminal 1.
18,25	WT L	LLS weighting terminal.
19,24	HPF L	LLS high-pass filter terminal.
20,23	ANT S	Anti-saturation terminal.
21,22	Rec. Out	Record signal (encoded signal) output terminal.
38	OFF/B/C	Dolby NR OFF/B-type/C-type select terminal.
40	CAL In	Calibration input terminal. Not used.
42	V_{EE}	Negative power supply input terminal.

U601 MSC7112 (Display Controller)

Pin No.	Signal Name	In/ Out	Function
1 2	OSC1 OSC0	I O	An RC circuit is connected for making an oscillation circuit.
3	$\overline{\text{POR}}$	I	Reset signal input at power ON. The IC is reset when "L".
4	VDD	—	Supplied with +5 V.
5 to 16	D1 to D12	O	FL tube grid drive output. (D8—D12 are not used.)
17 to 21	LED1 to LED5	O	Not used. (Open)
22	VSS	—	Grounded.

Pin No.	Signal Name	In/ Out	Function
23	VEE	—	Supplied with —25 V.
24 to 39	SEG P to SEG A	O	FL tube anode drive output. Active "H". (SEGP — SEGN are not used.)
40	SCLK	I	Shift clock input for internal shift register. Shifts the data at pin 41 (DATAIN) at every rising edge.
41	DATAIN	I	Control & display serial data sent from the mechanism control MPU (U501). MSB first.
42	LOAD	I	Data latch pulse. The data is latched to the internal register at the falling edge.

9.2. Schematic Diagrams
(1) Amplifier Section

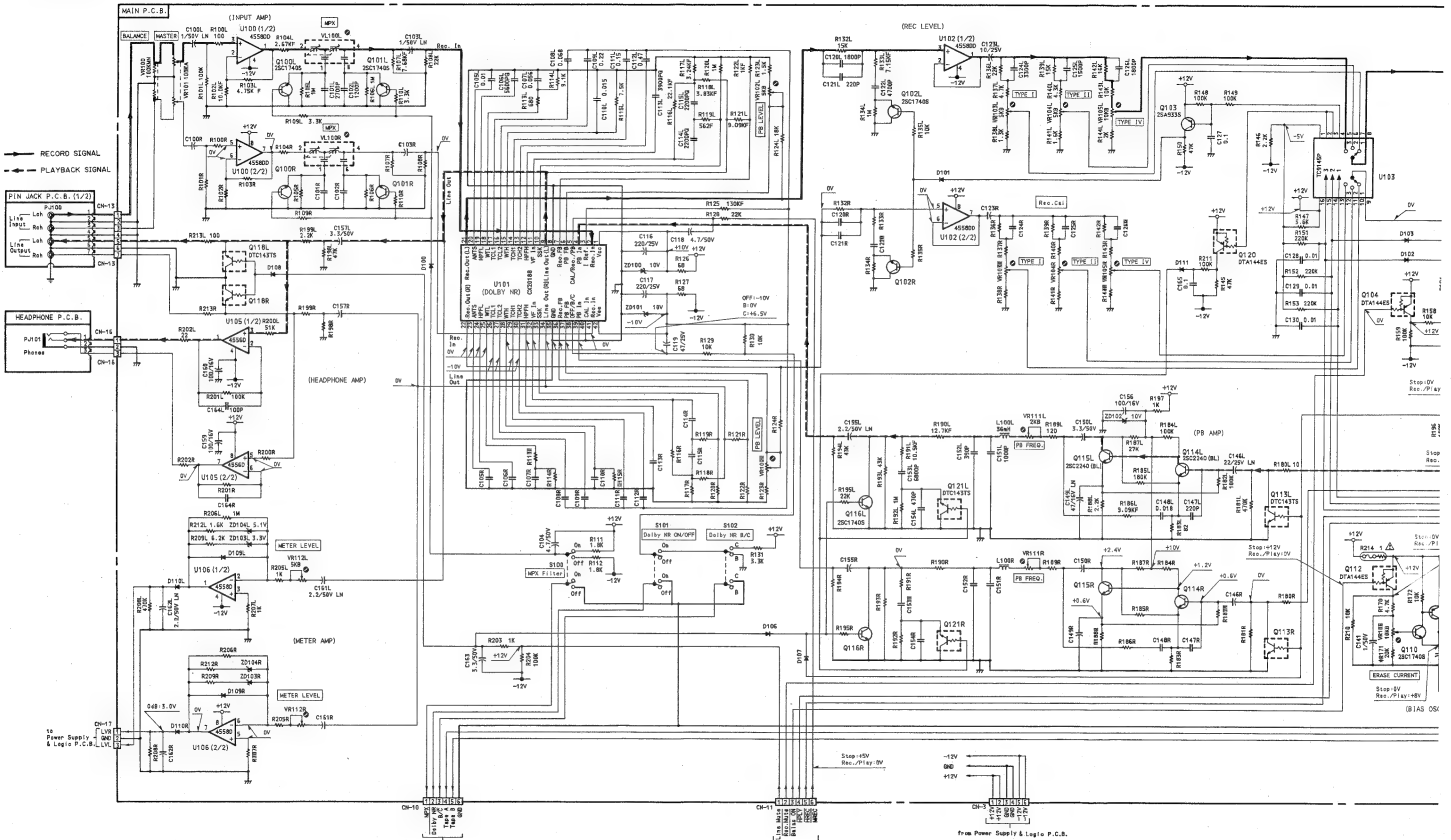


Fig. 9.2.1

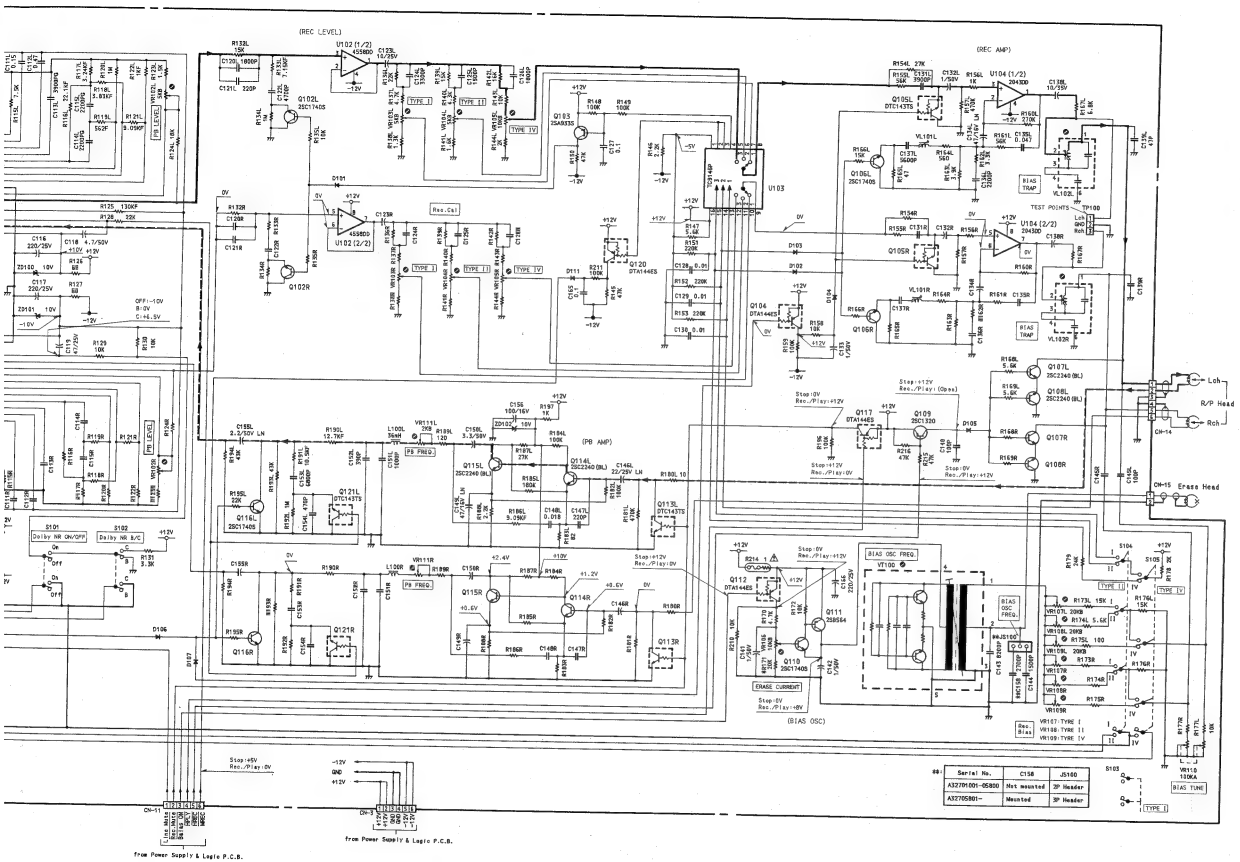
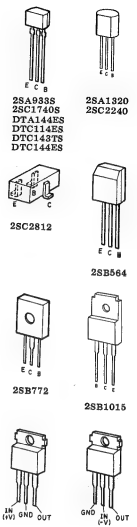
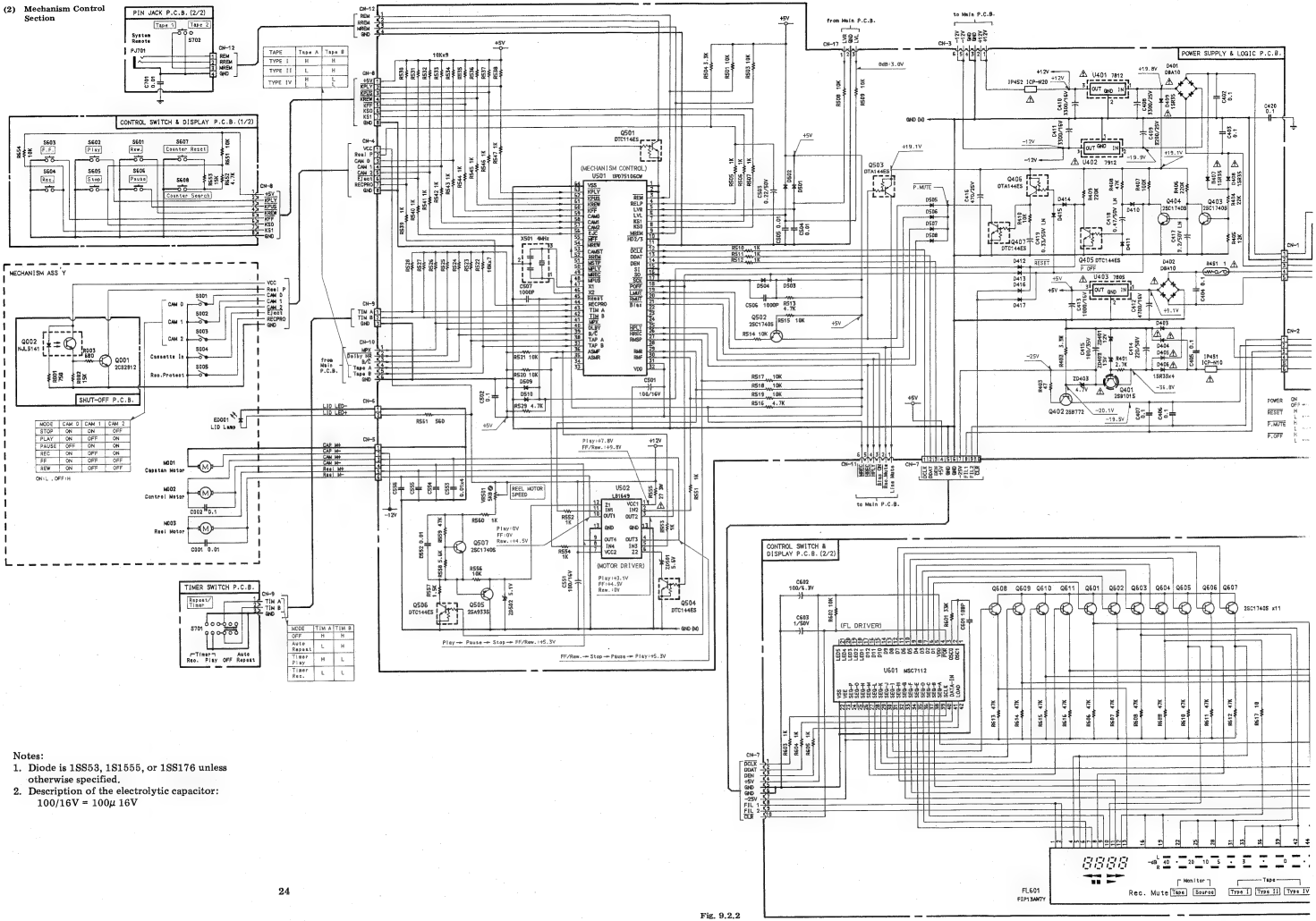


Fig. 9.2.1



*: Parts marked with * show typical value.

(2) Mechanism Control Section



Notes:
1. Diode is 1SS53, 1S1555, or 1SS176 unless otherwise specified.
2. Description of the electrolytic capacitor: 100/16V = 100μ 16V

Fig. 9.2.2

WARNING:
Parts marked with the symbol ⚠ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

It is recommended that the unit be operated from a suitable DC supply or batteries during initial check-out procedures.

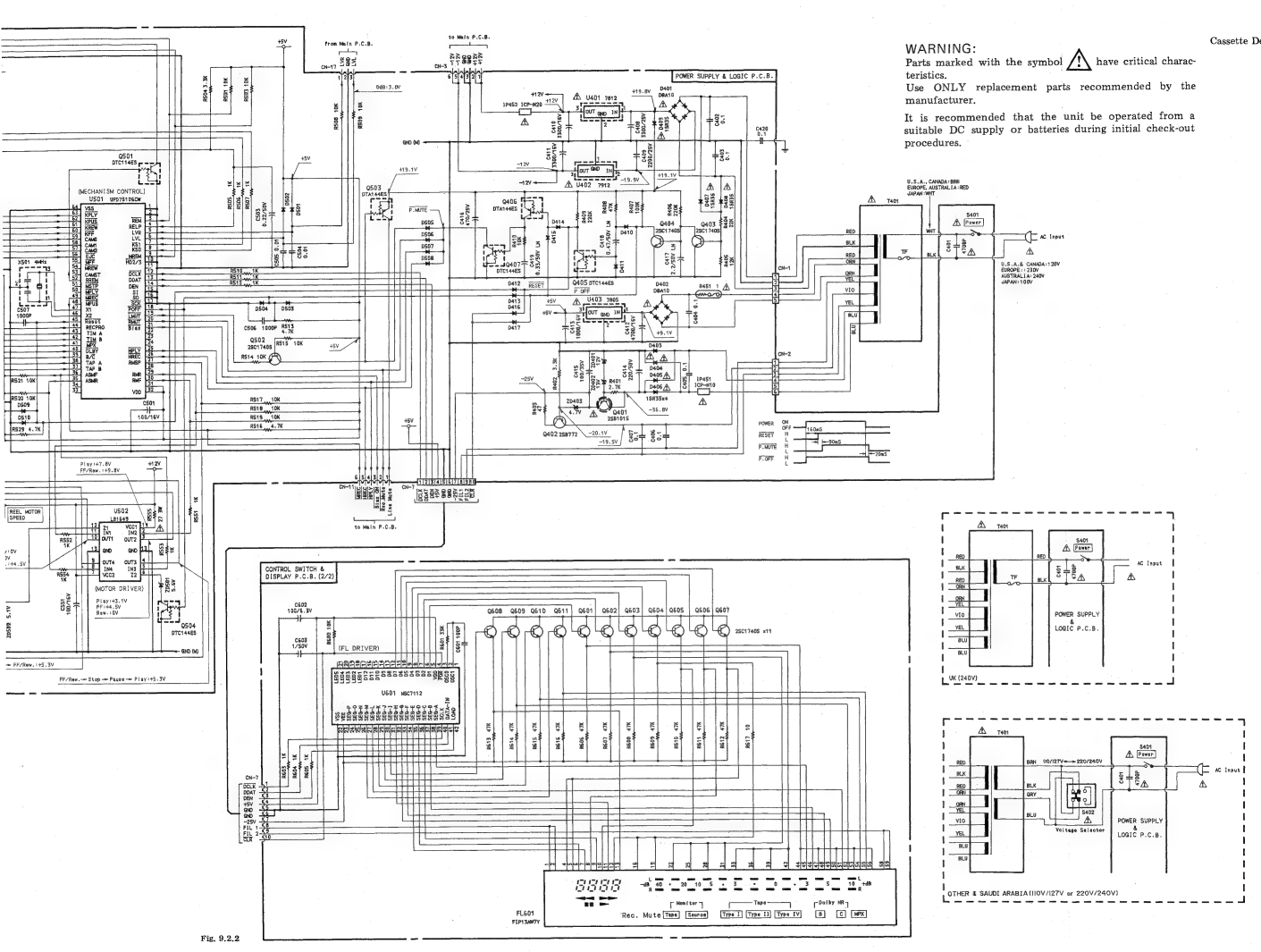


Fig. 9.2.2

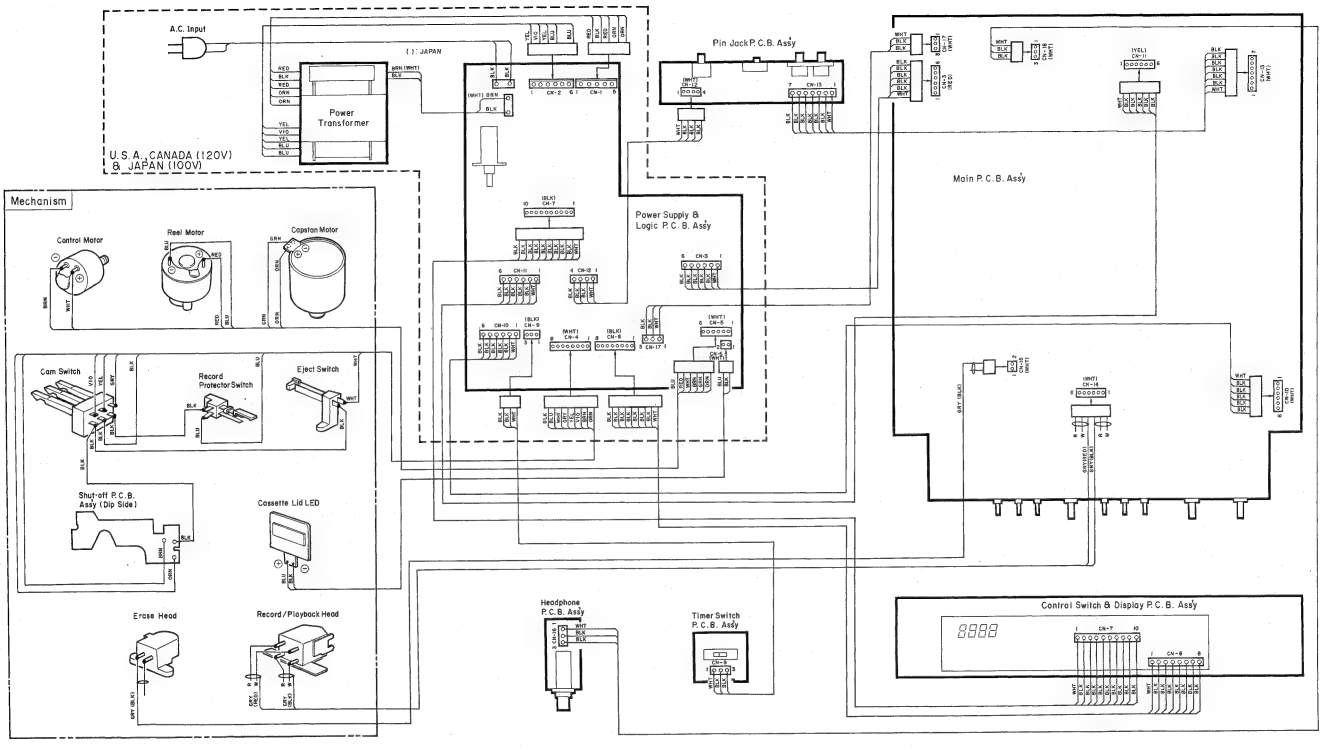


Fig. 10.1

Notes: 1. Table of wire colors

BRN — Brown	BLU — Blue
RED — Red	VIO — Violet
ORN — Orange	GRY — Gray
YEL — Yellow	WHT — White
BRN — Green	BLK — Black

2. Component side view of the P.C.B. is illustrated unless otherwise specified.
3. Wire tube color is shown in ( ).

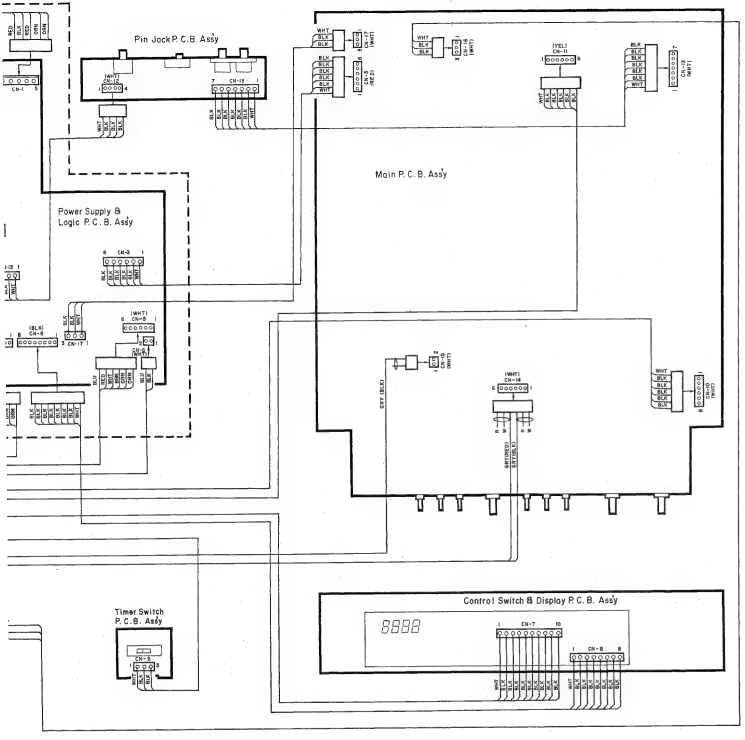


Fig. 10.1

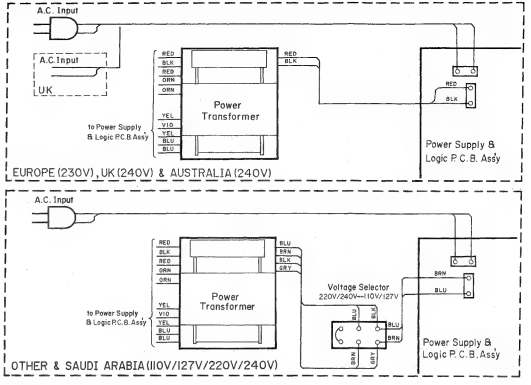


Fig. 10.2

11. BLOCK DIAGRAMS

11.1. Amplifier Section

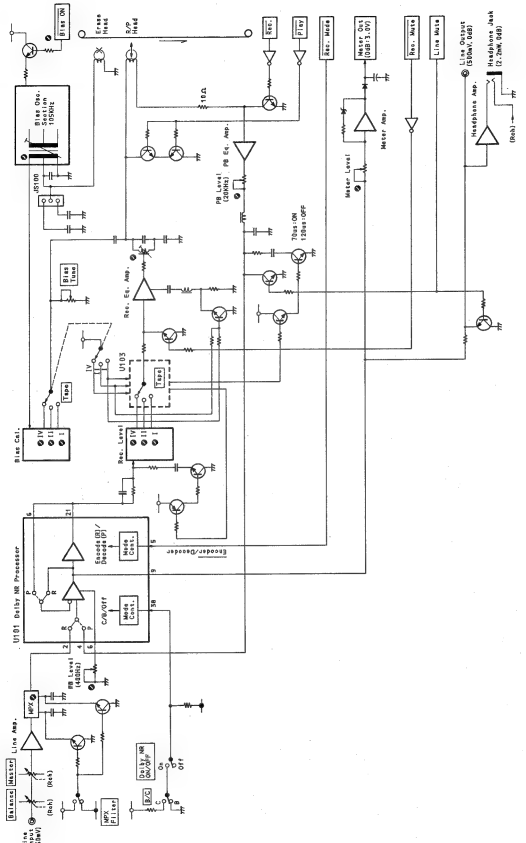


Fig. 11.1

11.2. Mechanism Control Section

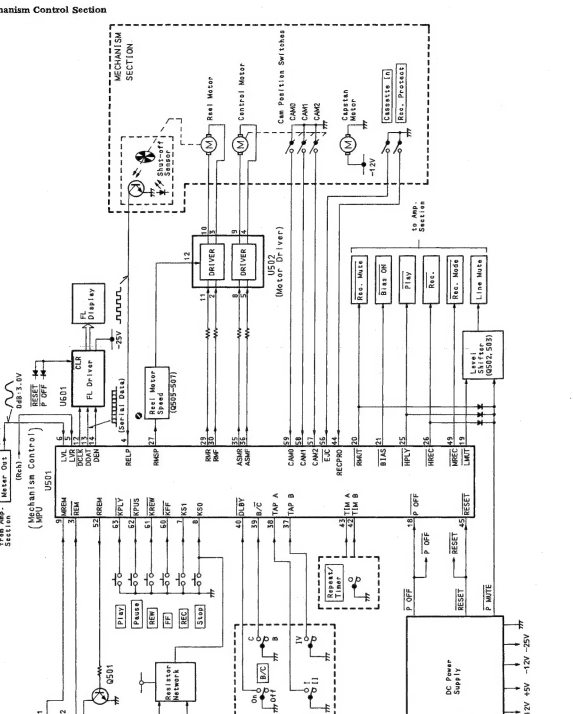


Fig. 11.2

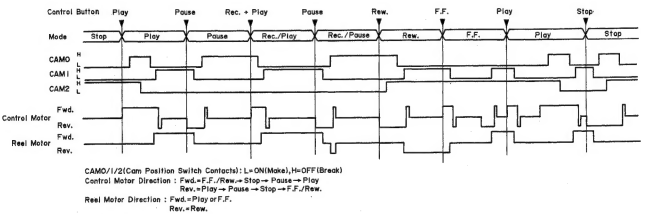
12. TIMING CHARTS AND EQ. AMP. FREQUENCY RESPONSE

12.1. Timing Charts
(1) Overall Timing Chart

Mode	Playback			Record		
	Stop	Play	Stop	Rec./Pause	Rec./Play	Stop
Reel Motor						
Line Mute						
Bias						
Rec. Mute						

Fig. 12.1.1

(2) Mechanism Control Timing Chart



CAM0/1/2(Cam Position Switch Contacts): L=ON(Make), H=OFF(Break)
Control Motor Direction : Fwd.=F.F./Rew.→ Stop→ Pause→ Play
Rev.=Play→ Pause→ Stop→F.F./Rew.
Reel Motor Direction : Fwd.=Play or F.F.
Rev.=Rew.

Fig. 12.1.2

12.2. Eq. Amp. Frequency Response

(1) Playback Frequency Response

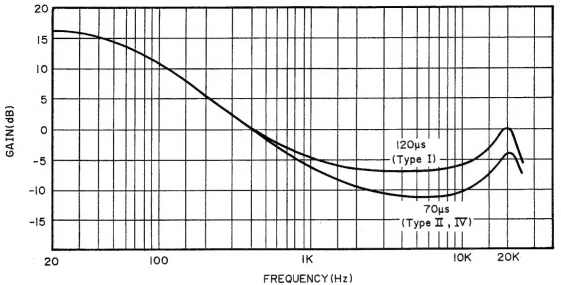


Fig. 12.2.1

(2) Record Current Frequency Response

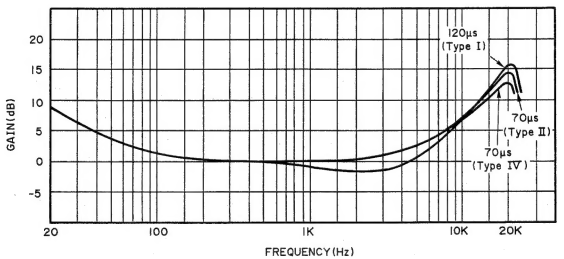


Fig. 12.2.2

13. SPECIFICATIONS

Track Configuration	4 tracks/2-channel stereo
Heads	2 (erase head x 1, record/playback x 1)
Motors	
<Tape Transport>	DC servo motor (capstan drive) x 1
	DC motor (reel drive) x 1
<Mechanism>	DC motor (cam drive) x 1
Power Source	120, 220, 240 or 110/127/220/240 V, 50/60 Hz
Power Consumption	25 W max.
Tape Speed	1-7/8 ips. (4.8 cm/sec.) ±0.5%
Wow and Flutter	less than ±0.11% WTD Peak
	less than 0.06% WTD RMS
Frequency Response	20—20,000 Hz ±3 dB
Signal to Noise Ratio	
Dolby C-Type NR On <70 μs, Type IV>	Better than 70 dB (400 Hz, 3% THD, IHF A-WTD RMS)
Dolby B-Type NR On <70 μs, Type IV>	Better than 64 dB (400 Hz, 3% THD, IHF A-WTD RMS)
Total Harmonic Distortion	Less than 1.2% <400 Hz, 0 dB Type I/IV>
	Less than 1.6% <400 Hz, 0 dB, Type II>
Erasure	Better than 60 dB (100 Hz, +10 dB)
Channel Separation	Better than 36 dB (1 kHz, 0 dB)
Crosstalk	Better than 60 dB (1 kHz, 0 dB)
Bias Frequency	105 Hz
Input (Line)	50 mV/40 kΩ
Output	
Line	0.5 V (400 Hz, 0 dB)
Headphones	2.2 mW/8 Ω (400 Hz, 0 dB)
Fast-Wind Time	Approx. 95 seconds (with C-60 cassette)
Dimensions*	430 (W) x 100 (H) x 320 (D) mm
	16-15/16 (W) x 3-15/16 (H) x 12-5/8 (D) inches
Approximate Weight	5.4 kg/11 lbs. 14 oz.

*: Dimensions do not include protruding parts. Height is the panel height.

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